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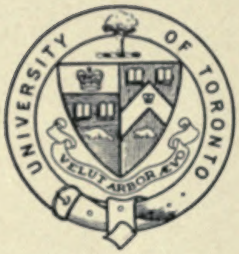
GULATION OF RAILROADS AND LITIES IN WISCONSIN

FRED. L. HOLMES



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REGULATION OF RAILROADS AND PUBLIC UTILITIES IN WISCONSIN

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REGULATION OF RAILROADS AND PUBLIC UTILITIES IN WISCONSIN

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BY

FRED L. HOLMES

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PREFACE

Wisconsin has been one of the pioneers in the field of railroad and public utility regulation by a state commission. The results of this legislation have, on the whole, been satisfactory. The aim of this volume is to present the important facts of this history of railroad and public utility regulation; to analyze the chief problems confronting this system of control and to measure the accomplishments, industrially and politically.

This study is the outcome of a continuous personal interest in the work of the Commission since its organization in 1905. As a member of the legislature, serving as chairman of the assembly committee on transportation, the writer has watched the development of the state regulation idea in Wisconsin, noted its shortcomings and its achievements. He has seen the confidence of the public in this plan manifested by each succeeding legislature, which has delegated to the Commission wider powers. An earnest attempt has been made to set down these facts about regulation impartially. If there be bias it is in favor of the present system, which has accomplished so much for the public, when contrasted with the deplorable condition—favoritism to shippers, inequality of rates and inadequacies of service—previously existing.

The files of the Commission have been at the writer's disposal; its statisticians and experts have been freely consulted for information that would throw more light on any beclouded problem of regulation. Wherever possible quo-

tations have been given from decisions, or the numerous published addresses of the commissioners, to more clearly state the economic principles followed in determining many of these complicated issues. Copious references have been made to decisions and other public documents, where the reader may pursue an investigation along any separate line. Many of the chapters embrace subjects that could better be handled alone in a single volume. Hence no attempt has been made to present other than the more important legal and economic considerations and their relationship to the whole problem of regulation.

To the many friends of the writer, whose names shall not be recorded but who have rendered invaluable aid and encouragement, I wish to evidence my profound appreciation. Without the coöperation, judgment and painstaking care in answering all sorts of requests made upon members of the Commission and its staff, this book would have been wholly inadequate in presentation and incomplete in data. Especially do I wish to acknowledge the faithful service and criticisms of the commissioners and staff, who have read most of the chapters: Professor Ford MacGregor, of the University of Wisconsin; Dr. T. S. Adams, of the Wisconsin Tax Commission; Judge E. Ray Stevens, of the Circuit Court of Dane County, Wisconsin; Justice John Barnes, of the Wisconsin Supreme Court, formerly chairman of the Commission; and F. W. MacKenzie, managing editor of La Follette's Weekly, who have ungrudgingly given time in preparing suggestions and making helpful changes.

The data presented in this book were found scattered through the files of the Commission, though never gathered into a continuous related statement as here presented. It was this fact, coupled with the current misinformation in some quarters of the advance that has been made by regulation which has encouraged me in the work. Here will

be found the results of the application of doctrines of regulation that are being challenged for authority or controverted in all states where they are still untried.

FRED L. HOLMES.

Madison, Wisconsin.
May 18, 1915.

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REGULATION OF RAILROADS AND PUBLIC UTILITIES IN WISCONSIN

CHAPTER I

PROVISIONS OF THE RAILROAD AND UTILITY LAWS

The Wisconsin Railroad Commission Law of 1905 was scientifically drafted. With the public utilities features later adopted, its provisions have been copied in part by a number of states.

The following is a list of the states whose laws relating to the regulation of public utilities are modeled more or less after those of Wisconsin.[1] In addition to those given here there are a few states such as Florida and Michigan whose regulation of telephone matters is somewhat similar to that of Wisconsin, and there are probably a few other states whose laws resemble the Wisconsin law in some respects. It is believed, however, that the following covers those having any substantial similarity to the Wisconsin law:

Arizona	Illinois
California	Indiana
Colorado	Kansas
Idaho	Maine

[1] The first ten states in this list were obtained from an article appearing in the *Nation* of April 2, 1914; the others have been obtained from an examination of the compilation of utility laws prepared for the National Civic Federation.

Maryland	Oregon
Missouri	Pennsylvania
Montana	Rhode Island
Nevada	Vermont
New Hampshire	Washington
New Jersey	West Virginia
Ohio	

The original Wisconsin railroad law was modeled after the Iowa statute regulating railroads, but it profited by the experience of other nations and the decisions of state and federal courts. Most of the amendments since made have granted extensions of power.

Members of the Commission are appointed by the governor for a term of six years. Each receives an annual salary of $5,000, the same as is paid the chief executive of the state. Both the manner of appointment and salary provisions were against the precedents in other states that had commissions at the time.[1] Nine states had changed from an appointive to an elective commission, leaving only six favoring the appointive idea. Governor La Follette, and a majority of the joint legislative committee considering the measure, favored appointment. The railroads approved an elective commission, believing that the election of a radical commission would place the law in disrepute and lead to its repeal. The governor and his supporters held the example of Iowa before the legislature, where, according to the eminent economist, Professor John R. Commons, "the commission was notoriously reputed throughout Wisconsin, at least, to be composed of three men nominated respectively by the three great railroad systems of that state."[2] The prevailing opinion of the time was that the success of the law depended upon the selection of

[1] *Review of Reviews*, XXXII, 76.

[2] *Ibid.*, 77.

the first commission. So the Wisconsin statute specified that one must have a general knowledge of railroad law and each of the others must have a general understanding of matters relating to transportation.

Broad, discretionary powers are conferred upon the Commission. They apply to both freight and passenger traffic, including express, private-car and sleeping-car traffic, and to refrigerator, street and interurban lines.

Unlike the provisions in many other states the Commission does not fix maximum freight rates, nor is it compelled to fix rates for a complete system. It is authorized to review any or all rates and, taking into account all evidence that has a bearing, to fix after full hearing a reasonable rate that shall be the legal charge. The general power of the Commission over railroads is incorporated in the following section of the statutes:

> Every railroad is hereby required to furnish reasonably adequate service and facilities, and the charges made for any service rendered or to be rendered in the transportation of passengers or property or for any service in connection therewith, or for the receiving, delivering, storing or the handling of such property, shall be reasonable and just and every unjust and unreasonable charge for such service is prohibited and declared to be unlawful.

Schedules of all rates, including joint rates, in force in the state must be on file at the Commission's office and two copies for the use of the public must be kept at every depot where passengers or freight are received. The roads are still free to make special rates. The law specifically provides that nothing in the act "shall be construed to prevent concentration, commodity, transit and other special contract rates," open to all shippers but under Commission supervision. All rates fixed by the Commission are absolute. The existing rates of the railroad were con-

sidered *prima facie* lawful and reasonable, which the roads cannot change without the permission of the Commission, and without giving thirty days' notice. This is a deviation from the practice in many other states where the Commission is directed to make lawful rates for all systems in the state on the assumption that the rates of the road are unlawful.

When any rate of a railroad is challenged, a hearing is ordered and a complete investigation is made. Up to this point, it must be shown that the rate of the railroad is unlawful, but as soon as the Commission fixes a new rate it in turn becomes lawful and the burden rests upon the carrier to prove its unreasonableness. Of course, the primary principle is that all discriminations and rebates are prohibited and that the Commission alone under the law has the power to order refunds for overcharges on freight shipments. The handling of these cases before the Commission and before the courts on appeal is similar for railroads and utilities and will be discussed later in the chapter.

The Commission controls all phases of the problem of service, safety, convenience and sanitation. It is given full power to regulate switching, demurrage, shortage of cars, weighing, the safe construction of roadbeds and rolling stock and every possible detail of railroad management touching either freight or passenger transportation. It orders the construction of spur tracks, the protection of dangerous crossings, the erection of depots and even the construction of union depots if public convenience and necessity demand. Before new lines of railroad can be built the promoters must obtain a certificate of public convenience and necessity from the Commission. It controls the schedules of trains and their connections at junction points. It may investigate the subject of wages, the hours of labor, and prescribe the number of men

engaged in switching service at any point. Under a law passed at the 1913 session of the legislature it can order the joint use of street-car tracks in order to facilitate the handling of traffic. The validity of this law is now being challenged in the courts.

Publicity is the background of the law. All the books of the railroad companies are thrown open to the Commission. State auditors are empowered to, and do, review the items. The railroads must file copies of all contracts that relate to transportation. The names and lists of all persons granted passes, recipients of mileage books issued at less than cost, with a complete statement as to why they were issued, must be filed. These are the more salient features of the law aside from the physical valuation of the properties. All of the decisions and statistical tables showing financial earnings must be published. The Commission's records are always open for public inspection.

REGULATION OF UTILITIES

In 1907, two years after the railroad law was passed, the legislature extended the Commission's powers to the public utilities of the state, including the light, telephone, water, heating and telegraph companies. In 1911 toll bridges, and in August, 1915, "jitneys," were brought within the scope of the Commission's powers. Utility legislation also covers rates and service both of municipal and private plants.

Unlike the New York and Massachusetts laws which attack the problem through the control of future capitalization, the Wisconsin statute makes the physical valuation of the properties the crux. The statute provides: "The Commission shall value all the property of every public utility actually used and useful for the convenience of the public. In making such valuation the Commission

may avail itself of any information in possession of the state board of assessment."

Probably no law on this subject in any state carries the publicity requirement as far as does the Wisconsin law. This is the safeguard that keeps commissions from falling under the control of the corporations. The public, too, is able to judge when given the facts. With publication of the facts provided under this law the ordinary man may determine whether the profits of the company and its rates are exorbitant.

No feature of the law, aside from physical valuation, has attracted wider attention than the uniform accounting provided for by law. The accounting has been adjusted to fit every size of plant and every class of utility. The law further provides: "No public utility shall keep any other books, accounts, papers or records of the business transacted than those prescribed or approved by the Commission."

In order that private initiative may not be discouraged, the law provides that the Commission may approve plans for profit sharing and the use of the sliding scale or any other method to encourage individual ingenuity in the reduction of rates.

Additional protection is furnished the private investor. The law grants each utility company an "indeterminate permit" to do business. All limited franchises have been repealed. The companies have been given in place thereof the right to a permit to do business during good behavior. Under this feature, however, the municipality can purchase the property at any time on a valuation to be fixed by the Commission. At first this feature was made optional with the utilities.

Finally the legislature of 1911 repealed all of the utility franchises in the state and granted in lieu thereof, indeterminate permits. This was possible under a clause in the

Wisconsin constitution which gives the legislature the power to alter or repeal any franchise. The corporation is given protection in return. No competition will be allowed an existing utility unless in the judgment of the Commission public convenience and necessity demand it. In 1911 the law requiring physical connection of telephone companies under Commission direction was passed and the telephone non-duplication law was enacted two years later, thereby extending the principle of regulated monopoly to all utilities except telegraph companies.

Municipal ownership is encouraged. The legislature of 1907 repealed the law prohibiting the construction of a municipal plant in competition with a private company. Municipalities may construct, purchase and own all utilities except telephones. Other existing utilities may be purchased by municipalities at any time following a favorable vote of the people at a compensation to be fixed by the Commission. Right to purchase street and interurban lines was granted by the legislature in 1913.

Following the principle that has made the Wisconsin railroad law distinctive when compared with other states, the utilities law provides that the Commission fix absolute and not maximum rates. This is designed to prevent discrimination. The Commission classifies the service of each utility and makes a rate uniform for each class. This difference in rate is a discrimination authorized by law. It also fixes the standards of service for the several classes of utilities—the voltage of electricity, the heating quality of gas, the pressure of water on mains, the facility with which telephone calls shall be answered by operators—and enforces these standards through frequent inspections. It has authority to order extensions of service to districts not already served.

Complaints to the Commission may be made by any person, firm, corporation or association, or by any mer-

cantile, agricultural or manufacturing society, or by any body politic or municipal organization. Often when the Commission receives a complaint limited in scope it makes a general complaint on its own motion that extends the investigation *ipso facto* over the entire field. When initiated the Commission's motion becomes the same as when a regular complaint is made. To set aside an order made by the Commission, the railroad or utility against which it is directed must prove its unreasonableness, thus shifting the burden of proof from the Commission to the corporation. If any new evidence is presented before the court the case is immediately remanded to the Commission. It may then enter a supplemental order. This necessitates that all facts be presented to the Commission in the first instance. On all appeals through the circuit and supreme courts of the state the law specifies that precedence be given these cases to expedite an early termination of the litigation. Failure of a railroad or a utility to enforce a Commission order within the period fixed by the decision, unless restrained by the courts, is punished by a fine of from $100 to $1,000 for each day's delay. The railroad law permits a maximum fine of $10,000 a day.

In 1911 the Commission was given authority to regulate water powers. This law was declared unconstitutional. Another, broader in scope, was passed at the 1913 session.

"Every public utility in the state, except streets, highways and bridges, is brought within its jurisdiction," says Professor John R. Commons.[1] "It becomes also a local government board, for it regulates towns, villages and cities in their management of these undertakings. Its authority is great and far-reaching. It employs experts and agents and fixes their compensation. It enters into the daily life of the people more than all other agencies of government combined."

[1] *Review of Reviews*, Aug., 1907, 224.

CHAPTER II

COMMISSION ORGANIZATION AND PROCEDURE

The Railroad Commission Law of Wisconsin was enacted in 1905. It created an appointive commission of three members in whom are reposed broad powers. Discriminations and rebates were prohibited. The books of the railroad companies were thrown open. Governor La Follette appointed Professor B. H. Meyer, now of the Interstate Commerce Commission, who was succeeded in 1912 by David Harlowe, for many years connected with the traffic department of the Allis-Chalmers company of Milwaukee; Halford Erickson, still a member of the Commission; and John Barnes, now a justice of the Wisconsin Supreme Court, who was succeeded in 1907 by John H. Roemer, a Milwaukee attorney. Carl D. Jackson succeeded Mr. Roemer, and Walter Alexander succeeded Mr. Harlowe by appointment in 1915.

The Railroad Commission has under its supervision properties valued roughly at half a billion dollars. The forty-eight intrastate and interstate railroads were assessed at $340,242,000 in 1913; the sleeping-car and equipment companies at $2,666,000; the twenty-eight street and interurban lines were valued at $60,945,000; the six express companies at $807,500; and the four telegraph companies at $2,025,000. A law passed in 1907 extended like supervision over utilities. In 1912 the 643 telephone, 271 electric lighting plants, 53 gas concerns, 194 water companies and 17 heating concerns had $44,969,856 common and pre-

ferred stocks and $46,893,810.10 outstanding bonds, with gross earnings aggregating $21,050,777, and were serving a consuming public of 666,524. In 1911 the legislature extended the Commission's authority over toll bridges and water-power companies of the state. How the Commission has proceeded in handling this monumental task will be detailed in later chapters.

As previously noted the law creating the Railroad Commission provides for the appointment by the governor of three commissioners, each for a term of six years, one of whom shall have a knowledge of railroad law, and the other two shall have a general understanding of matters relating to railroad transportation. The law further provides that the Commission appoint a secretary; employ a sufficient number of clerks and stenographers to perform the clerical work of the office, and such experts and temporary employees as are necessary to perform any services required. At the outset it became apparent that the cases brought before the Commission were chiefly of three classes, namely, those concerning rates, those involving service, and those in which legal questions arose. It was found that efficiency could be best maintained by having one commissioner supervise the handling of cases of one class only, a practice which has continued ever since. Even after the additional duties of administering the Public Utility Law were given by the passage of the act of 1907, the Commission adhered to this general plan of division of duties.

As the work of the Commission has grown, the staff of employees has necessarily been increased. Soon after organization it became essential that the Commission have an assistant secretary to aid the secretary in the handling of such matters as came under his jurisdiction. When the legislature added to the duties of the Commission the administration of the stock and bond law, it became the custom for the assistant secretary to make all investigations

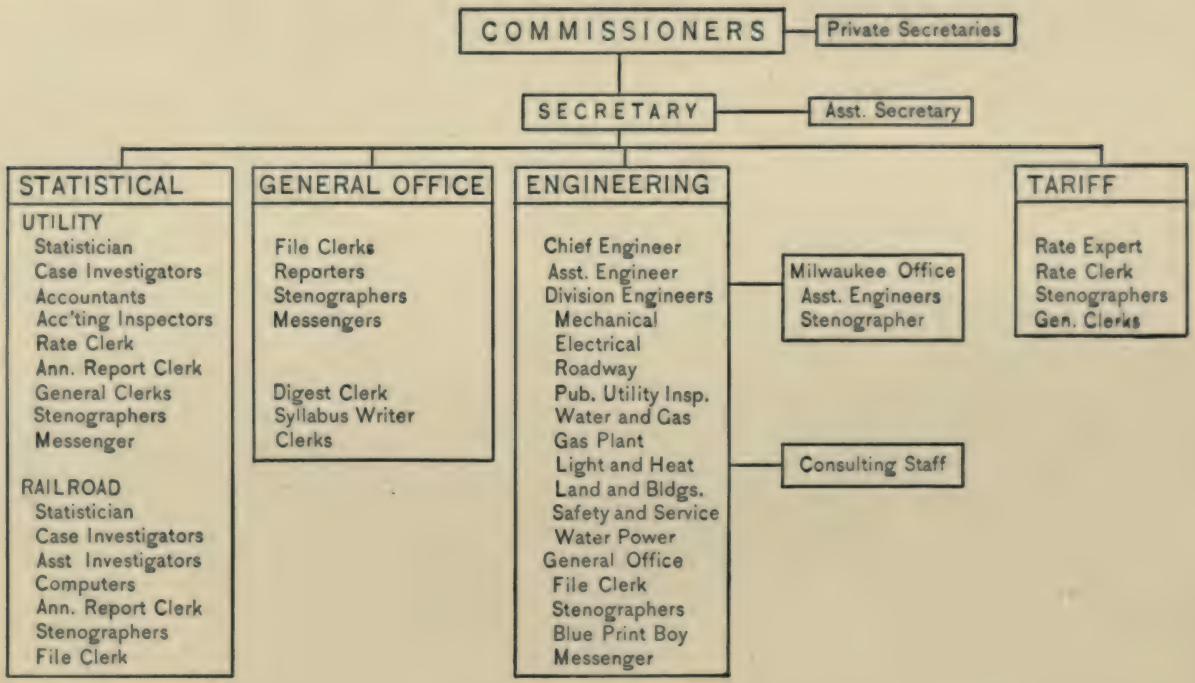
and recommendations pertaining to the stock and bond cases. Later amendments to the stock and bond law have so increased the work in connection with cases of that class that not only does it take the larger part of his time, but it has been necessary to have additional help to attend to the work.

Each commissioner has a secretary who attends to the office routine. The secretary of the Commission is the executive head of all the other employees. The staff under his direction is divided into four different departments, namely, the general office force, the statistical, engineering and tariff departments.

The general office staff includes the shorthand reporters, whose duty it is to take and transcribe the records of hearings, the filing clerks, stenographers, general clerks and messengers. The secretarial force of this office receives and distributes all mail, and all letters sent out in reply are signed by the secretary in the name of the Commission. The work of making digests, syllabi and indexing is done in the general office.

The statistical work necessary for the decisions of the Commission is of such a nature that it has been found advisable to divide the statistical staff into two divisions, one of which deals with the problems arising from the administration of the law which gives the Commission jurisdiction over railroads, express companies and telegraph companies, and the other handling work of a similar nature under the provisions of the Public Utility Law. Each division is headed by a statistician. By means of this segregation the Commission is enabled to study more thoroughly than would otherwise be practicable the peculiar problem of the classes of business with which each division is working.

One of the duties of the railroad statistical division is the supervision and tabulation of the reports of common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Statistician
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Accountants
Acc'ting Inspectors
Rate Clerk
Ann. Report Clerk
General Clerks
Stenographers
Messenger
RAILROAD
Statistician
Case Investigators
Asst Investigators
Computers
Ann. Report Clerk
Stenographers
File Clerk
GENERAL OFFICE
File Clerks
Reporters
Stenographers
Messengers
Digest Clerk
Syllabus Writer
Clerks
ENGINEERING
Chief Engineer
Asst. Engineer
Division Engineers
Mechanical
Electrical
Roadway
Pub. Utility Insp.
Water and Gas
Gas Plant
Light and Heat
Land and Bldgs.
Safety and Service
Water Power
General Office
File Clerk
Stenographers
Blue Print Boy
Messenger
Milwaukee Office
Asst. Engineers
Stenographer
Consulting Staff
TARIFF
Rate Expert
Rate Clerk
Stenographers
Gen. Clerks

carriers, with the exception of street and electric railways. These last two were included in the provisions of the original Railroad Commission Law, but the fact that many of them are operated in conjunction with power and lighting plants has led to the diversion of the work connected with them to the utility statistical department. Every carrier makes an annual detailed statement showing the operations, both of the system as a whole and of the Wisconsin portion, for the year ending June 30. On December 31, each year, the steam railroads make another report which covers somewhat different ground. The railroad statistical division prepares the blank forms for both of these statements, supervises their preparation and checks and tabulates the reports as they are returned. From these official statements and from other sources the department prepares its tabulations of unit costs of operation. A wide variety of units is in use, probably the most important being the miles of road—locomotive miles, train miles, car miles; the number of locomotives, of freight and passenger cars; the number of passengers; the number of tons of freight carried, and the number of ton and passenger miles made. One of the most significant functions of the department is the analysis of the costs of operations together with the operations to which these costs are related, so that it may determine the costs of the various services performed. These investigations are probably the most important as well as the most extensive and complex of the many made. Miscellaneous data essential to the decision of cases is also supplied through this department.

The Public Utility Law of 1907[1] provides that every utility shall file with the Commission at the close of business on June 30 each year a balance sheet and such other information as the Commission shall prescribe. Further-

[1] A recent amendment requires telephone companies to report their condition at the close of business on Dec. 31.

more it must show in itemized detail the various elements of cost per unit of product or service. These figures the Commission must publish in its annual report. Naturally this work of compilation and checking is a portion of the labors of the utility statistical division, but the department also embraces a number of other functions which are mentioned in more detail in the following pages. Some of these are as follows:

I. Preparation of accounting and statistical data for use in formal cases.

II. Preparation of similar data for informal cases.

III. Accounting work, consisting of auditing and checking financial records and furnishing accounting assistance to utilities.[1]

IV. Keeping the files of public utility rates, rules and regulations and preparing the rates for publication.

V. Determination of unit costs as provided by law.

VI. Collection and compilation of material for reports, as provided by law.

The engineering staff serves jointly the railroad and the tax commissions, and has been organized with a view of serving to the best advantage in the various lines of engineering work required by the two commissions. The department is in charge of the chief engineer, under whom is an assistant engineer. Professor W. D. Pence, recently appointed by the Interstate Commerce Commission as one of a commission of five to value the railroads of the United States, was chief engineer for the Wisconsin Railroad Commission for several years before his appointment. The general office force of the department attends to the filing and stenographic work, the blue-printing, and cost-keeping

[1] The third phase noted, that of accounting, is elaborated in another chapter.

for the department. One civil engineer inspector with a corps of assistants handles the valuation of roadways and roadway structures and makes situation surveys in connection with investigations of grade crossings, valuation and inspection of bridges, track elevation work and track inspection. The mechanical inspector and those who assist him make valuations of steam roads, rolling stock of steam roads, boilers, engines, pumps and piping in connection with railroad and public utility plants and further attend to such special investigations as are necessary in complaints against heating companies. The electrical equipment inspector and his assistants bear the same relation to electric lines as does the mechanical inspector to the steam roads. The electrical distribution and telephone inspection group handles the valuation of electrical distribution systems and telephone plants. In charge of the water and gas distribution is a civil engineer inspector who, with his assistants, values gas and water mains, gas holders and steam pipes; investigates the sources of water supply, and in coöperation with the mechanical engineer makes fire stream tests and pressure surveys for determining the adequacy of water-works service. The gas plant equipment inspector handles the valuation of gas plant equipment and various gas engineering problems. The expert on light and heat and his immediate assistants have charge of the inspection of the quality of the service furnished by gas and electric light and telephone companies. The civil engineer inspector in charge of valuation of land and buildings values the land, foundations, buildings, furniture and fixtures. The safety service inspector investigates railway service and accidents and supervises the installation and operation of the interlocking plants and block signals. The passage of what is known as the Water Powers Act by the legislature of 1913 has necessitated the establishment of another division of the staff which handles the engineering phases

of the water-power problems. Within the past few years the Commission has found it best to establish a branch of the engineering department in Milwaukee. There have arisen so many cases which require almost constant attendance of members of the engineering staff in that city that several men have been permanently assigned to that office.

The tariff department has charge of all schedules of rates relating to railway and express companies. On May 17, 1911, the legislature enacted a law providing that no change in rates or classification shall be made until such change has met the approval of the Commission. Applications for amendments to utility rates, or for new rate schedules, are investigated by the Commission. If they constitute increases a formal case is required. The number of such applications examined each year is as follows:

Applications for Amendments to Rates Investigated

Year Ended	Railroads	Utilities	Total
June 30, 1912*	1,006	69	1,075
June 30, 1913	837	278	1,115

* Records of these applications not tabulated prior to 1912.

The denial of most of these applications, which would be put into effect immediately if there were no commission, saves the public many millions of dollars a year. Chapter 59 of the Laws of 1913 provides that any person may send or bring to the Commission any railroad or express expense bill or receipt, and have it examined for correctness as to weights, rates and charges, and if after investigation the Commission shall find any weight, rate or charges incorrect, it shall order the company in error to refund to the person aggrieved. Both of these statutes have materially

increased the labors of the tariff department. All the rates of public utilities are kept by a rate clerk under the direction of the utility department statistician.

Some years ago the regents of the University of Wisconsin established two "working fellowships," providing that two graduate students of the department of economics should devote half their time to study and half to the work of the Commission. These students are assigned to the different departments as their services are needed and thus come in touch with the whole work of the Commission.

From the time of its organization to June 30, 1913, the Railroad Commission of Wisconsin had considered 2,511 formal and 5,237 informal cases. While the larger part of these were complaints brought before it by the people of the state, they by no means constitute all the cases considered by this Commission. Conditions are often found which lead to an investigation by the Commission on its own motion. This is especially true of the cases relating to railroad service and crossings.

Perhaps the most important work of the Commission is hearing and deciding the various cases which arise under its jurisdiction and carrying its decisions through appeals

CASES BEFORE OR INVOLVING THE COMMISSION

Year ended June 30	Railways		Utilities		Stocks and bonds	Convenience and necessity	Suits against Commission	Total exclusive of informal	Grand total
	Formal	Informal	Formal	Informal					
1906	57	350	.....	.....	.....	.....	.....	57	407
1907	107	630	.....	.....	.....	.....	.....	107	737
1908	121	673	83	246	39	14	4	271	1,180
1909	175	642	67	496	45	12	3	302	1,440
1910	157	432	57	144	58	16	2	290	886
1911	167	285	98	87	54	12	5	336	708
1912	282	402	109	139	143	10	10	554	1,095
1913	268	502	112	209	196	12	6	594	1,305
1914	265	506	154	300	168	9	20	616	1,322
Total	1,599	5,402	680	1,621	703	85	50	3,127	8,760

to the courts. The preceding table lists the cases chronologically as commenced.

Many other complaints, besides those resulting in these cases, are settled in conferences or by correspondence, without action between the parties. The Commission's daily mail averages three hundred letters. Complaints and petitions which have to be passed upon number more than twenty-five for every working day of the year.

Of all the cases brought before the Commission thus far the records show that between 90 and 95 per cent are decided in favor of the public.

It is well in this connection to trace the procedure in a formal case before the Commission. When complaint is brought against a public service corporation, the secretary sends to the respondent company a copy of such complaint, and notice that investigation has been started. After ten days, a time and place of hearing are set. The complainant may be represented by counsel or may appear in person, or, if he so please, may submit his case by brief. Exhibits are submitted at the hearing by both parties. If the matter involves rates, it is generally heard by the commissioner whose duty it is to take charge of such cases. The matter is then taken up by the engineering department which makes a valuation of the plant. These valuations are made for rate purposes, for municipal purchase, stock and bond cases and, in some instances, to furnish a basis for opening accounts. When the valuation is completed the facts are turned over to the statistical department. A careful analysis is there made of the financial and statistical data submitted at the hearing, and comparisons made with information from other sources. It is often necessary to obtain more detailed information before the proper comparisons can be made. An investigation of statistics of operation and sales, including statistics of load and output, of consumption, development of business and saturation of

territory, the percentage of consumers and sales metered, the product lost and unaccounted for, and the distribution of sales, is thoroughly gone into, as is the determination of the basis of return and of normal operating expenses. The cost curve is then drawn and submitted and from this the Commission is enabled to formulate a schedule of rates.

The procedure in a railroad or express case is very similar. It may be noted, however, that the railroad valuations are made from year to year, while the valuations of public utility plants are made only when required.

When the case before the Commission involves service, station facilities, grade crossing or track elevation or depression, the commissioner who handles such cases holds the hearing at or near the place in question and very often makes personal investigation of the situation. If this plan is impractical a member of the engineering staff is detailed to make a thorough study of the problem and submit a report.

If no effective date for an order is fixed by the Commission, the law, under the terms of the statute, becomes effective within twenty days. Generally, however, the order gives respondent a certain number of days to comply with the order. The opinions of the Commission are published separately, after an order is made, and later gathered into bound volumes, of which thirteen have already been issued.

There are complex problems in many cases which require the compilation of additional data and delay decision in the matter. Expert advice is also often essential, especially in the engineering problems which arise. Fully half of the employees of the Commission are graduates of the University of Wisconsin. Hon. Max Thelen, now a member of the California Commission, after making a study of the different state commissions, recently said of the Wisconsin

Commission and its relation to the University of Wisconsin:[1]

This relation is of very great assistance both to the University and to the Commission. It helps the University, because quite a number of her instructors are enabled to do practical work and to bring to their classes the point of view of a practical man. The University is also very materially aided because the people of the state see that it is helping them to solve some of their most important practical problems, and for that reason gives her generous support. The arrangement is also of very material assistance to the Commission. It gives to the Commission unprejudiced men of scholarliness and thoroughness and high ideals of public service. I am convinced that the Wisconsin Commission could not have attained its present high stage of efficiency if it had not been for its close association with the State University.

[1] Thelen, Report on Leading Railroad and Public Service Commissions to California Railroad Commission, 1911, 42.

CHAPTER III

PHYSICAL VALUATION OF RAILROADS AND UTILITIES

Physical valuation of railroads and public utility properties as a basis for determining service requirements and rate schedules is as essential in the plan of state regulation of these enterprises, as an inventory cost of each grade of article in a retail store is necessary to the storekeeper before placing his goods upon the market. In the past twenty years a new economy has gained foothold. The tendency is not to base charges for service on what the traffic will bear, but upon the cost per unit of service. Physical valuation is an important factor in the establishment of *peaceable relations* between the public and the utilities. When combined with the proper determination of operating expenses, it will aid in giving the public the true cost facts.

Up to 1903 the railroads of Wisconsin were not valued for taxation purposes as other properties. They paid taxes in the form of license fees upon their gross earnings. A report of the state Tax Commission showed that the railroads paid only .53 per cent of their market value (gauged on average value of stocks and bonds) in taxes, while the farmers, manufacturers, home owners and others paid 1.19 per cent, or over twice as much. Such a disclosure finally resulted, after a bitter fight, in the passage of the ad valorem taxation law,[1] which provided for the physical

[1] La Follette, Autobiography, 243; Report of Wisconsin Tax Commission, 1907, 269-293.

valuation of the railroads of the state, and the taxation of them on the same basis as general property. The immediate effect was to increase railroad taxes more than $600,000 annually.[1] Physical valuation was made the foundation stone of the Railroad Commission Law enacted two years later. The valuation theory has since been extended, both for taxation and rate-making purposes, to the other public utilities of the state.

The Railroad Commission is directed by law[2] to ascertain the amount of money expended in the construction and equipment of every railroad, the cost of the right of way and "the amount it would require to secure the right of way, construct the roadbed, tracks, depots and other facilities for transportation, and to replace all of the physical properties belonging to the railroad." It must also ascertain the amount of outstanding bonds, when issued, the price paid, and the amounts paid in securing franchises. All similar information in possession of the state Tax Commission is placed at the disposal of the Railroad Commission.

The first railroad valuations in 1903 were made by Professor W. D. Taylor and an engineering staff under the direction of the state Tax Commission. These figures have since been revised annually. In this work the plan followed was similar to that adopted by Michigan and as outlined by Professor Mortimer E. Cooley of Ann Arbor.[3] Since 1905 the engineering staff has made these valuations jointly for the Tax and Railroad commissions.

The physical valuation of the railroads of the state includes an inventory of each railroad's property to the minutest detail, even to the bolts and paint, and a determination of cost of reproducing the same railroad system

[1] Report of Wisconsin Tax Commission, 1909, 83.
[2] Revised Statutes for 1913, sec. 1797-20.
[3] Report of Tax Commission, 1907, 269.

in its present condition. The cost of reproduction is assumed to be what it would cost to reproduce the road at present prices. In order to get normal present prices the average prices for five years are obtained.[1] The cost of reproduction in present condition is the cost of reproduction new less the amount of accrued depreciation. The final appraisal sheets for each road contain thirty-seven items of physical valuation, of which the more important are: right of way, station grounds, real estate, grading, tunnels, bridges, ties, rails, track fastenings, frogs, switches and crossings, ballast, track-laying and surfacing, fencing, crossings, cattle guards and signs, interlocking and signal apparatus, telegraph and telephone lines, station buildings and fixtures, shops and roundhouses, tools, water stations, fuel stations, grain elevators, warehouses, docks and wharves, miscellaneous structures, engineering superintendence and legal expenses at 4.5 per cent of the cost of reproduction new of all of the items before mentioned—locomotives, passenger equipment, ferries and steamships, electric plants, shop equipment and tools, freight on construction material, interest during construction and stores and supplies.

These items are divided and subdivided and given in such detail that the Railroad Commission has before it fairly reliable information to guide it in making rates upon a fair value of the property. How this valuation is used preparatory to making rates is probably best outlined in the Buell case which was an application for a reduction of passenger fares. This opinion has been used as an economic textbook for study in some of the college classes of the country and the basis laid down in it was followed by the federal post-office authorities when they recently inquired into the cost of handling the mails on passenger trains.

[1] Report of Tax Commission, 1912, 13.

Discussing the question of a railroad valuation for rate-making purposes the Commission in the Buell case said: [1]

What constitutes a fair valuation of the plant? Is it the original cost of construction, the amount at which it is capitalized, the cost of reconstruction new, or the cost of reproduction up to its existing condition? The original cost of construction is an item that cannot generally be ascertained except for relatively new roads. Most of the roads were built by construction companies whose records are not in existence, and then turned over to some company at a different value than the original cost. Many of the roads are undergoing constant improvements; in fact, some of them have been almost entirely rebuilt since the time of their first construction. The original cost as well as the amount that has been expended upon the plant to any given date, exclusive of the maintenance, are items that for these and other reasons cannot be obtained, and which would probably be of little value if they could be had.

The capitalization of the roads, or the bonds and stocks issued by them, in most cases falls short of being a fair index to a reasonable valuation. The main reason for this is found in the manner in which these securities are issued. The railroads are often both constructed and equipped by the proceeds obtained from the sale of their bonds, while the stock is often thrown in as a bonus. Again, bonds and stocks are often issued for other purposes than construction. Many roads, for instance, issue securities for the purpose of acquiring an interest in other roads, or in other property than that which can properly be considered as a part of their respective plants. At times the securities are sold at a discount and the bonds alone may often amount to more than the entire cost of the road. For these and other reasons the capitalization is subject to great variations. In some cases it may greatly exceed the amount actually invested, or what might be a fair valuation of the property. In other cases, again, it may correspond quite closely to the true value of the plant, or it may even amount to less than this value. From these facts it

[1] *Buell* v. *Chicago, Milwaukee, and St. Paul Railway Company.* 1 Wisconsin Railroad Commission Report, 478 et seq.

seems clear that the bonds and stocks which are outstanding may not represent what the roads are reasonably worth and the amount upon which they are entitled to a fair return.

The cost of reproduction has been suggested as the valuation that might be fair to all concerned. This cost includes the value of the right of way, yards, and terminals at two and one-half times the prices of adjacent real estate, or at some other price ratio. It also includes the cost of buildings and structures of all kinds, new, if constructed at current prices of material and labor. It further includes the labor and material at current rates for the construction of the road and its equipments, together with engineering, superintendence, legal expenses, cost of organization, cost of material on hand, freight charges on the material used, etc. In short, it includes every item of expense which would be involved in building the road to-day, including the interest on the investment during the construction period.

The cost of rebuilding the road in question in this state to-day would no doubt be considerably greater than it was at the time when the greater part of it was constructed. . . . The construction of a considerable portion of the road was subsidized by land grants and bonuses of various kinds. Whether under these conditions the cost of reproduction new to-day can be considered a fair basis of the valuation of the property for the purposes in view, may perhaps be questioned. On the other hand, it can perhaps be said that the owners of the railroad property are entitled to any increase in the value of their property that may accrue from the progress of the territory in which it lies, and that they have as much right to the natural increments in the physical value of their property as the owners of any other property.

The cost of reproduction new, reduced by depreciation in the property caused by use, has also been suggested as a basis for valuation. The value obtained upon this basis can be defined as the value under existing conditions. In this case the costs of the right of way and grading, and of the material on hand are, of course, the same as under the cost of reproduction new, but practically all the other items are lower. This value represents the physical property used for the purposes of transportation at

the time of the appraisal. On the face of it, it would appear to be most equitable of all the valuations upon which the interest should be figured. Whether this is really so depends upon many other factors such as the provisions which have been made for depreciation and how cost of reproduction new compares with the original cost of construction where this can be ascertained. Depreciation is as a rule covered by the allowance which is regularly made for maintenance. . . . .

If a single basis of valuation is to be adopted the cost of reproduction, less depreciation, is the lowest that might be figured. The stock and bond valuation calculated on the market values of the securities would be the highest. The first basis leaves out of account the value of the plant as a going concern, the business it has built up and the business connections it has made. The second basis may be the direct result of excessive rates. While the cost of reproducing, new, the property of the railway company under consideration in Wisconsin as found by the tax commission, in 1905, was $62,970,000.00, the property was actually assessed by said commission in that year for $73,700,000.00. What may be a fair value in a given year for taxation purposes is not necessarily a fair one for rate-making purposes. The franchise value or the earning power of a railway property may be and often is enhanced by the imposition of excessive rates.

But in so far as the courts have laid down any rule for our guidance, we are precluded from adopting any single basis of valuation, to the exclusion of other bases or considerations. In the Smythe-Ames case, cited *supra,* the United States Supreme Court says that in order to ascertain a correct valuation the original cost of construction, when it can be determined, the amount expended in permanent improvements, the amount and market value of the stock and bonds, the present as compared with the original cost of construction, the probable earning capacity of the property under lawfully prescribed rates and the sum required to meet operating expenses, all are matters for consideration and are to be given such weight as may be just and right in each case. The court says that it is even probable that other considerations should be taken into account in determining the question.

We have carefully considered this matter of valuation and the various elements that should be taken into account as decided by the court. Our conclusion is so near to the cost of reproduction new, that we have concluded to adopt that valuation, not because it happens to be made on any particular basis, but because it is equivalent to a composite value arrived at after taking into account the various elements suggested by the court.

VALUATION OF PUBLIC UTILITIES

Practically the same methods as are employed in the valuation of railroads are used by the Commission in valuing public utilities. The law requires the Commission to value "all of the property of every utility actually used and useful for the convenience of the public." Considering every phase of the law, what is desired is a "fair valuation." The original cost of construction, the cost of reproduction new, the cost of reproduction less depreciation, financial statements detailing revenues, operating expenses and capitalization, are considered. All of these costs must be carefully studied, with special reference to local conditions, in fixing the valuation. Neither the "market value" nor the "capitalized value" of a public utility furnishes a safe foundation for rate-making. Such valuations may be predicated on excessive rates which are themselves in dispute.[1] The same objection holds true when the valuation is based on a capitalization of net earnings.

The first step in the process of valuation is to secure a complete inventory of the plant. The original cost should then be found from an examination of the books and records of the company. Many difficulties have been encountered by the investigators in this field. In some of the older plants the records have been lost or destroyed [2]

[1] *Hill et al.* v. *Antigo Water Co.*, 1909, 3 W. R. C. R., 722, 1,025.

[2] *State Journal Printing Co. et al.* v. *Madison Gas & Electric Co.*, 1910, 4 W. R. C. R., 557-558, 933; *City of Milwaukee* v. *T. M. E. R. & L. Co.*, 1913, 10 W. R. C. R., 1, 84, 872.

and those who participated in the early operations of the company can furnish little information due to the lapse of time. Chairman John H. Roemer, of the Railroad Commission of Wisconsin, in an address before the Southern Gas Convention, at Mobile, Alabama, April 23, 1914, said that "in numerous cases of appraisement, approximating one hundred and fifty, there were few in which the financial and engineering records of the plant from its inception were in existence and available. In most all cases it was necessary to construct a history of the plant from such isolated records as could be found and such facts and traditions as the memory of those living could furnish and principally from comparative data with respect to similar plants." The experience of the Commission has shown that the difference between an original cost valuation based on a complete history and a cost obtained for the same plant constructed according to comparative data, is almost nil. The original records can seldom be relied upon without the closest scrutiny. Often it is discovered that items have been raised to an arbitrary level to offset or furnish a basis for stock issues. Items that should be charged to operating expenses are found in the construction account. All these errors must be eliminated.

This value, again, may be different for a plant which has not been constructed at one time, but by piecemeal depending upon the needs of the population to be served. But as a rule such extensions cannot be urged as more costly. After much investigation the Commission in a leading case said:[1]

> While there are conditions that tend to increase the cost under piecemeal construction, there also appear to be certain factors which may have the opposite effect. Extensions to plants are often of such nature that their cost during the construction

[1] *State Journal et al. cit. supra.*, 549, 931.

period is met out of the current receipts or funds on hand in such a way that little or nothing in the way of interest charges is in reality incurred until the extensions are in operation and financed in the usual manner. Again the planning and supervision of the work of such extensions is often, if not always, performed by the regular officers and employees of the company without any increase in the salary or wages. The entire amount of such supervisory cost is usually charged to the operating expenses, and this tends materially to reduce the cost of engineering and supervision of these extensions. These and similar economies, often practicable under the conditions described, are not without significance in passing upon the cost of piecemeal construction and may go far in offsetting many of the factors which usually make piecemeal construction relatively the more costly.

When all of these book facts have been gathered and tested, among the more important cost items to be found will be: land, labor, materials, cost of promotion, bond discounts, cost of engineering services, legal advice, interest on capital during construction, taxes, insurance and general expenses during the construction period and cost of contingencies that arise during the process of construction. The final result obtained from collecting these items will be the original cost of the plant.

The original cost value thus obtained does not represent the present value of the properties. From the day that the plant was completed it began to depreciate in value. Obsolescence, age and inadequacy make the parts less valuable when appraised than when new. As this depreciation is constantly going on a part of the operating income should be set aside annually that the plant may be replaced when it becomes useless. Sound as this business policy seems, it was not generally adopted by the utilities until after the enactment of the Public Utility Law. The aim in the establishment of the depreciation fund is to keep the original investment intact. A system of uniform ac-

counting, and plans for depreciation allowances, described in later chapters, prescribe the limitations upon the use of the depreciation charges and thus prevent the use of the fund for other purposes. To obtain the value of the plant at the time of the appraisal it is necessary to determine the amount of depreciation [1] and deduct the same from the original cost.

Next the cost of reproduction of the plant is ascertained. With a complete inventory of the properties used and useful to the utility and a suitable price per unit for each piece of property determined, the result will be the cost of reproduction of the plant. To derive this cost requires a great deal of engineering work and special skill. The prices used [2] in computing the reproduction cost demand the closest study to eliminate abnormalities and to prevent duplications. Usually average prices for five years are applied in computing the valuation. In determining the cost of reproduction new, the Commission makes an allowance of 12 per cent on the cost of the physical property to cover such items as interest during construction, engineering, expenses for legal work, organization, casualty insurance and contingencies.[3] In the construction of a municipal plant a 10 per cent allowance has been found sufficient.[4] Such allowances are technically known as "overhead charges."

The propriety of including "overhead charges" in an estimate of the cost of reproduction new of the plant has never been seriously questioned. Engineers, economists

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[1] For an elaborate discussion of "Depreciation," with statistical life tables, *see* Commissioner Erickson's address before the Convention of Central Water Works Association, Detroit, Mich., Sept. 25, 1912.

[2] *Hill et al. op. cit.* 638-640, 1,026.

[3] *State Journal et al. op. cit.* 540-546; *City of Sheboygan* v. *Sheboygan Railway & Electric Co.*, 1911, 6 W. R. C. R., 360, 891.

[4] *Dick et al.* v. *Madison Water Commission, op. cit.*, 917.

and operators all agree that these extra costs exist, the only question being the amount that should be allowed in each case. This will, of course, depend upon local conditions.

Overhead charges, according to one author,[1] may be classified under six heads: (1) engineering and superintendence; (2) contingencies; (3) contractor's profit; (4) interest during construction; (5) legal and general expenses, company organization, taxes and insurance; and (6) promotion.

Of these extra costs contractor's profit is often included in the unit prices. At times, too, other of the costs enumerated may be included in unit prices. The important point is that when these costs are included in unit prices they should not be again included under "overhead charges."

Separate allowances are often made for "bond discounts" and "working capital." Bond discounts have been included in valuations on the theory that they represent the cost of getting capital. Bond discounts are usually composed of two items: brokerage and discounts proper. Both items represent payments for the use of money and may therefore be regarded as deferred interest. Working capital usually includes stores and supplies on hand and funds required to bridge the credit period between outlay and repayment. It therefore represents investment as much as do expenditures made for plant.

For land actually used and useful to the utility in conducting its business, even though such land may have been a gift to the utility, under the terms of the law requiring a fair valuation, the Commission holds that it must be included in the valuation at a price computed for like prices of contiguous property, or at its original cost

[1] R. H. Whitten, "Valuation of Public Service Companies," XII, 216.

plus the increment in value since.[1] The reproduction value is usually the most important factor[2] in determining the valuation of the physical property of the plant for rate-making purposes. The law specifically directs that the cost of reproduction less depreciation is one of the factors to be considered by the Commission in determining a fair valuation.

"While the cost of reproduction new is not likely to correspond to the cost of constructing the plant," says the Commission in a leading decision,[3] "there are many reasons for believing that the two figures in the two cases are not likely to be very far apart. Whatever difference there may be in this respect, is likely to be at least partially due to such changes as have taken place in the prices of materials and labor between the time of construction and the time of appraisal."

But the original cost of the physical property and the cost of reproduction are not the only elements to be considered in arriving at a valuation. Allowances for "going value" of the plant, "good will," and "franchise value" are always urged by the utilities. Upon each of these questions the Commission has taken a definite stand that is at variance in some instances with the court and commission decisions in other states.

To have real value the plant must be a "going concern" serving customers, who pay for the service rates high enough to cover operating expenses, depreciation, and reasonable returns for interest and profits upon the investment. The building-up of this business entails a heavy expense for advertising, demonstrations and solicitation.

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[1] *State Journal et al., op. cit.*, 535-536; *City of Ashland* v. *Ashland Water Co.*, 1909, 4 W. R. C. R., 305-306; *City of Appleton* v. *Appleton Water Works Co.*, 1910, 5 W. R. C. R., 239, 919.

[2] *Hill et al., op. cit.*, 638, 640, 1,026.

[3] *In re application Manitowoc Gas Co.*, 1908, 3 W. R. C. R., 163, 167, 1,026.

At first the public may not understand the advantages of the service. It must be educated. Investors realize that these expenses are necessary to put a plant upon a paying business basis. Under the name of "going value"[1] the Commission allows for this expense, under certain conditions and limitations, in fixing a valuation. When, however, conditions unusual or abnormal, such as inefficiency due to managerial oversights,[2] arise in any particular investigation, they must first be eliminated before a reliable result can be obtained.

In scores of cases the question of "going value" has been passed upon by the Commission. It is not a "franchise value," nor is it "good will." A view of its reasoning is presented in the following excerpt from a decision:[3]

> That the net costs of building up the business must also be taken into consideration in determining the value of the plants for rate-making purposes would seem to apply with special force where by law the rates are limited so as not to yield more than reasonable returns upon the investment. While such legislation may not be a guarantee against loss of any kind, it is clear that if the rates fixed under these laws should not include anything for the cost of building up the business, there would be no way in which these costs could be made good to the investors. In that event these costs would become a permanent loss

[1] *Hill et al.* v. *Antigo Water Co.*, 1909, 3 W. R. C. R., 706-711; *In re Menominee & Marinette Lt. & Tr. Co.*, 1909, 3 W. R. C. R., 778, 792; *State Journal Printing Co.* v. *Madison Gas & Elec. Co.*, 1910, 4 W. R. C. R., 501, 577; *City of Appleton* v. *Appleton W. Wks. Co.*, 1910, 5 W. R. C. R., 215, 276; *Cunningham et al.* v. *Chippewa Falls W. & Lt. Co.*, 1910, 5 W. R. C. R., 302, 315; *City of Milwaukee* v. *T. M. E. R. & L. Co.*, 1912, 10 W. R. C. R., 122-123; *Superior Commercial Club et al.* v. *Superior W. Lt. & P. Co.*, 1912, 10 W. R. C. R., 704, 742. Commissioner Erickson, Address on "Going Value," Terre Haute, Ind., Sept. 23, 1914.

[2] *In re application Oconto City Water Supply Co.*, 1911, 7 W. R. C. R., 516-517, 877.

[3] *City of Racine* v. *Racine G. Lt. Co.*, 1911, 6 W. R. C. R., 277-285, 888.

to them; and the consumer in turn would be relieved from paying a reasonable return on a part of the investment, or on the capital that is devoted to furnishing them the service in question. This is a situation of which the investors are taking due notice, and which is entitled to due consideration. If not taken into account it will tend to keep capital from entering this field as well as to prevent exact justice to capital which has already entered the same. The former would result in hardships or inconveniences to the consumers; the latter would apparently be unjust to at least many of the present investors in public utilities. . . . The cost allowed for the net cost of building up the business should not include items that have been incurred under other than usual conditions, or items that could have been avoided by the exercise of ordinary care and business judgment. . . .

In addition to those mentioned, there is also another element that should receive some consideration in fixing the cost of the business, and that is the profits the plants have earned since they reached a paying basis. If these profits are so large as to be considerably above those ordinarily obtained, it is as conceivable that strict justice between investors and consumers might require that these excesses should be treated as an offset to early losses and that in this way all or a part of the earlier losses may have been wiped out. . . . Just how much importance should be attached to the difference in the earnings as between the earlier years and later years, is not clear. Much depends on how the operating expenses, including depreciation, have been treated, and what sums have been included therein or excluded therefrom. . . .

Expenditures for the development of the business, when reasonable and when well placed, would, therefore, seem to be legitimate and to constitute a charge that, in some form, should be borne by the customers or by those who avail themselves of the services in question. Whether these expenditures should be charged to construction and thereby become a permanent charge on the consumers, or be charged to the operating expenses and thereby wiped out about as incurred, are questions that cannot be settled independently of the surrounding conditions. When the rates and the earnings of the utility are such as to yield a

reasonable return to the investors, if the expenditures in question are included in the operating expenses, then "operating expense" also appears to be the place to which they should be charged. When, on the other hand, the rates and earnings are not high enough to permit these expenditures to be charged to operating expenses without resulting in less than reasonable returns on the investment, then it would seem that until the earnings become adequate, at least, they should be charged to the cost of the plant. These rules are supported by reasons that appear to meet the requirements under ordinary conditions.

Most public utilities are monopolies within their territory. They operate usually without competition. In many rate cases it has been urged by the utilities that some valuation should be allowed for "good will." This has been denied by the Commission on the ground that "good will" does not adhere to monopolies but is based on free competition and voluntary patronage.[1] It has also declined to include the value of patent rights. The Commission declares that rights of this kind are secured because they are profitable, or because, in one way or another, they tend to increase the net earnings. It holds that the prices paid for rights of this kind would seem to be operating expenses, rather than capital charges,[2] and "if regarded as capital charges at all, they ought to be written off during the life of these rights from the profits for which they are responsible."

Neither should there be any allowance for the valuation of a franchise above its actual cost to the company in obtaining it. It has a value for taxation purposes in that it furnishes the holders with the right to carry on their business with profit. At all of the early valuation

[1] *In re Cashton Lt. & P. Co.*, 1908, 3 W. R. C. R., 84-85; *Hill et al., op. cit.* 720; *Payne et al.* v. *Wis. Tel. Co.*, 1909, 4 W. R. C. R., 60.

[2] *City of Milwaukee* v. *T. M. E. R. & L. Co.*, 1912, 10 W. R. C. R., 92, 873.

hearings before the Commission, utility owners urged that a value should be given to the franchise, and an amount included in the valuation to be fixed for rate-making purposes. The only measure of franchise value recognized by the courts is the earning capacity of the property. Earnings depend upon rates. The futility of the task of determining the reasonableness of rates by any standard dependent upon the value of a franchise must be apparent.[1]

In denying the request to include a franchise value in the Antigo Water Works case, one of the early important utility valuations, the Commission pronounced the following doctrine to which it has adhered:[2]

> It is difficult, if not impossible, to discover any justice in the practice of including in the valuation of a plant, for rate-making purposes, such values of its franchise as are based on surplus earnings only, or which have not cost the plant anything. For a city or town to grant franchise privileges free of cost, to permit so high rates for the services rendered under it that the franchise acquired considerable value, and then to permit this value to be included in the capital account of the plant and thereby become a permanent charge on the consumers, would hardly seem fair from any point of view. Under such practices utilities are not only given the opportunity of making safe investments, which would yield reasonable returns, but they are, in addition to this, granted valuable privileges which enable them to exploit their business. To include anything in the value upon which rates are based for which no equivalent has been rendered, would apparently disturb the equitable relation that should be maintained between utilities and their customers.
>
> The conclusion that it does not appear to be equitable as between the investors and the customers of public utilities to include any other franchise value in the valuation of such utilities for rate-making purposes than such values which are rep-

[1] *City of Appleton* v. *Appleton Water Works*, 1910, 5 W. R. C. R., 215, 281, 282.

[2] *Hill et al., op. cit.*, 729, 1019.

resented by the cost of franchises to these utilities, may be at some variance with the practices of many appraisers in valuing such plants. It may also be somewhat out of line with the opinions of at least some of the courts upon this question. The conclusion, however, would seem to be almost unavoidable, when the various factors involved are analyzed in the light of economic principles.

As stated in a previous chapter the Wisconsin legislature in 1911 repealed all franchises in the state and granted in lieu thereof indeterminate permits. It has likewise been held by the Commission that these cannot operate to enhance the value of the property upon which returns must be computed.[1]

In fixing a fair value of the utility property the Commission considers as more or less controlling the original cost of construction, the amount expended in permanent improvements and extensions, the reproduction cost new, the reproduction cost new less depreciation, and going value. To eliminate fluctuations in market prices due to temporary causes the reproduction cost is based on material and labor prices for five years prior to the appraisement.[2] Bond issues are investigated. An allowance is made for "working capital."[3] After all of these facts have been ascertained, the Commission fixes a tentative valuation. Following a hearing on the valuation, at which the utility and the public are permitted to present additional evidence, the necessary adjustments are made by the Commission and the final valuation is announced. The Commission

[1] *City of Appleton et al., op. cit.*, 284-285; *In re Cashton Lt. & P. Co., op. cit.*, 84.

[2] *City of Whitewater* v. *Whitewater El. Lt. Co.*, 1910, 6 W. R. C. R., 132, 139; *Racine* v. *Racine Gas Lt. Co.*, 1911, 6 W. R. C. R., 238; *City of Appleton et al., op. cit.*, 228-235; *In re Manitowoc Water Works*, 1911, 7 W. R. C. R., 71, 85.

[3] *City of Beloit* v. *Beloit W. G. & El. Co.*, 1911, 7 W. R. C. R., 187, 242, 881.

has no specific rule in determining this valuation except its prudence and judgment as applied to the facts. Upon this valuation a fair return is permitted and the amounts for interest and depreciation are computed preparatory to prescribing rates.

This, in brief outline, is the method of determining "fair value" for rate-making and municipal purchase purposes. The limits of a single chapter preclude an exhaustive discussion of the principles of valuation as interpreted by the Wisconsin Railroad Commission. For a detailed discussion of special features of the method employed, the reader should consult the Commission's published reports of cases, and the papers and discussions printed from time to time by its members.

That valuations fixed by this method [1] are usually lower

Case	Present value	Total award	Total award per cent in excess of present value
In re Village of Cashton (3 W.R.C.R., 67)...	$2,688	$3,100*	15
In re Fond du Lac (5 W.R.C.R., 482).....	281,922	320,000	13
In re Appleton (6 W.R.C.R., 97).....	242,127	255,000	5
In re Manitowoc (7 W.R.C.R., 71).....	231,647	247,500	6
In re Kaukauna (8 W.R.C.R., 409).....	44,992	50,000	11
In re Oshkosh (12 W.R.C.R., 602).....	510,953	525,000	3
In re Antigo (13 W.R.C.R., 156).....	119,229	128,800	7
In re Beaver Dam (13 W.R.C.R., 169).....	126,651	133,000	5

* Including damage to property not taken.

than those fixed by the courts in condemnation proceedings will appear quite clearly. The principal reason may be found in the fact that courts and condemnation juries usually place a value upon the unexpired franchise. In a

[1] The following table of Wisconsin Commission cases, where property was valued for municipal purchase, shows the amount allowed for "intangibles":

Comparisons with court cases may be found in brief filed by Olin, Butler and Curkeet in *McGregor-Noe Hardware Co. et al.* v. *Springfield Gas & Electric Co.* and *Springfield Traction Co.*, before Missouri Public Service Commission.

long line of cases the courts have held that a franchise is property which must be paid for when it is taken in condemnation proceedings. In Wisconsin, under the Public Utility Law, where the indeterminate permit has superseded the ordinary franchise, the Commission has decided that an indeterminate permit has no value. Beginning with the case of the Cashton Light and Power Company, it has consistently held that no value attaches to a permit to do business, when the municipality determines to acquire the property. This doctrine was challenged in the case of the *City of Appleton* v. *Appleton Water Works*.[1] Upon appeal to the circuit court the court held that the indeterminate permit had at least a nominal value. The case was carried to the Supreme Court of Wisconsin. Justice Winslow gave the opinion of the court. He held in substance that an indeterminate permit was much like a franchise for a term of years, after the term of years has expired. Furthermore, the court pointed to the fact that the legislature had in mind ultimate public ownership and also the advantages resulting from an option to purchase at any time. "One of these advantages," the court said, "plainly is that there can be no unexpired franchise to be considered or allowed for in case of purchase."[2]

In the case of the Manitowoc Water Works Company, which was an application for determining just compensation to be paid to the company by the city of Manitowoc for its property, the tentative valuation of the physical property as of January 1, 1911, showed a present value of $231,647. A similar valuation as of December 1, 1907, showed a present value of $209,437. A board of appraisers composed of disinterested persons had valued the property as of December 26, 1906, fixing the same at $235,321. Approximately five years later, the "fair value" of these

[1] *City of Appleton* v. *Appleton Water Works*, 5 W. R. C. R., 228.
[2] 154 Wisconsin Reports, 121.

properties, applying the Commission's general method varied by such facts as local conditions suggested, was fixed at $236,000.

It is interesting to compare this case with that of the *Long Island Water Supply Company* v. *Brooklyn*.[1] The city of Brooklyn had purchased the property and franchises of the Long Island Water Supply Company under a special act of the legislature. The franchise had about thirty-eight years to run. The franchise was determined not to have been exclusive. The total award granted the owners of the property was fixed at $570,000, divided as follows: for the land, $77,500; for the pumping plant, reservoir, distribution system and all other appurtenances, $292,500, and for the franchise, $200,000.[2]

It should not be inferred that the Wisconsin method of valuing public service property is preferable because it has occasionally resulted in lower valuations than those which would have been fixed by other methods. No method unless it is based upon considerations of equity to all concerned can be made to deal justly with the conflicting interests involved, and will establish that degree of stability and definiteness in the relations between owners and users which a continuous rendering of adequate service requires.

One further well-known fact should not be overlooked. A commission employing regularly a corps of experts who have acquired intimate knowledge of the peculiar conditions surrounding each plant is more likely to arrive at reasonably close and fair valuations than a body organized temporarily without such intimate knowledge.

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[1] 166 U. S., 685.

[2] Other cases involving the valuation of properties in condemnation proceedings, where franchises were specifically held to be subject to compensation, are the following: *Montgomery County* v. *Schuylkill Bridge Co.*, 110 Pa. State, 54; *Monongahela Navigation Co.* v. *United States*, 148 U. S. 312; *Town of Bristol* v. *Bristol and Warren Water Works*, 23 Rhode Island, 274.

In its chief aspects the Wisconsin Railroad Commission's method of determining "fair value" has been confirmed by the Wisconsin Supreme Court. Certain features have also been sustained by courts and regulating bodies in other states. Fair value as based upon the cost of reproduction new was approved by the Massachusetts Joint Board which made an appraisal of the property of the New York, New Haven and Hartford Railroad. It was approved also in the appraisal for rate purposes, of the People's Gas Light & Coke Company of Chicago. In the case of the Columbus Railway and Light Company against the city of Columbus, Ohio, the fair value of the property was taken as its cost of reproduction new. When depreciation is computed on the sinking fund plan, cost of reproduction new as the standard of value has been upheld by the New Jersey Public Utilities Commission.

It is not correct to speak of a standard method of valuation. Thus in a discussion of general principles in *Hill* v. *Antigo Water Company* the Commission says:[1]

While the cost of reproduction new is thus ordinarily one of the important, if not the most important, elements that enter into that valuation upon which the earnings should be based, there may also be instances when the cost of reproduction new less depreciation, which, as stated, represents the present value of public utilities, may bear a close relation to the valuation in question. This may apply with special force to plants, the rates of which have, on the whole, been ample to cover operating expenses including depreciation, and a fair amount for interest and profits, but in which cases the amount collected for the depreciation has not been set aside or used for the purposes for which it was collected, but on the contrary, has, in one form or another, been distributed among its stockholders. . . . If the stockholders, instead of keeping up the plant, have appropriated for their own use the money contributed by the customers for this purpose,

[1] *Hill et al., op. cit.*, 623.

the amount so appropriated should either be returned to the depreciation fund or deducted from the valuation upon which the rates are based.

Thus there are conditions when fair value for rate-making purposes should take into consideration the amount of accrued depreciation. This view is in line with the rule laid down by the United States Supreme Court in *Knoxville* v. *Water Company*.[1]

The making of these valuations constitutes a considerable part of the expense incurred by the Commission. The following table shows the number of utility valuations that have been made:

NUMBER OF PHYSICAL VALUATIONS, EXCLUSIVE OF STEAM RAILROADS

Calendar years	Utilities		Street and interurban		Water powers		Total original	Grand total
	Original	Tentative, approximate or revised	Original	Tentative, approximate or revised	Original	Tentative, approximate or revised		
1907.....	19	2	21	0	0	0	40	42
1908.....	31	24	4	21	0	0	35	80
1909.....	30	24	2	25	0	0	32	81
1910.....	21	22	1	27	0	0	22	71
1911.....	31	32	10	18	1	0	42	92
1912.....	69	54	2	28	0	6	71	159
1913.....	45	68	0	28	1	9	46	151
Total..	246	226	40	147	2	15	228	676

The valuation of the steam railroads of the state has been annually revised since the first valuation in 1903 .

[1] 212 U. S., 1.

CHAPTER IV

RATE OF RETURN

Principles promulgated by the Railroad Commission of Wisconsin for the valuation of properties, for the establishment of service, and the introduction of advanced accounting, have now been quite generally accepted by the people and the utilities. Aside from the ascertainment of the exact facts in each case, there is little contention over the applications of the rules to be followed. With the rate of return to be allowed a railroad or utility upon its investment the question is different. This is to-day the most mooted problem in the field of regulation. It is a source of dispute and argument before every state commission in every case affecting plant earnings. In the establishment of rates for service this factor is exceedingly important.

Many of the other state commissions have cautiously dodged this subject. The problem has been considered of such importance that the Wisconsin Commission has made it the theme of extended investigations. In three leading cases,[1] and many minor ones, it has been the subject for lengthy discussions and the fundamental principles that shall govern are announced. Because of the well-reasoned position taken by the Commission these decisions are of importance.

By rate of return is meant the amount of interest and

[1] *Hill et al.* v. *Antigo Water Co.*, 1909, 3 W. R. C. R., 623; *State Journal Printing Co.* v. *Madison Gas & Electric Co.*, 1910, 4 W. R. C. R., 501; *Payne et al.* v. *Wisconsin Telephone Co.*, 1909, 4 W. R. C. R., 1.

profit allowed upon the actual investment of a public utility. Older economists have generally classed interest with profits; but the Commission has followed the later economic writers who differentiate the two factors on the theory that "interest arises from the use of[1] capital, and profits have their source in the business ability, skill and foresight of the management, as well as the risks assumed by it or by the *entrepreneur*." This distinction, while unimportant under the economic conditions of a quarter of a century ago, is vital to-day under modern business methods. Discussed in many cases,[2] it is perhaps stated the most succinctly by Commissioner Erickson in a recent address when he said:

"Before the advent of the modern methods of doing business and the present facilities of credit, the capitalist and the employer were one and the same person. Under these conditions there was no very good reason for separating the compensation of these two factors. Since the advent of the corporations, systems of credit and other modern conditions, all this has changed. To-day a condition has developed under which business is largely carried on with borrowed capital. Those who furnish the capital receive interest thereon. Those who borrow it and use it in their business pay the interest, and, as compensation for their services of management and the risks they assume, receive profits or the surplus above the expenses. This condition has led to the separation of the functions of the capitalist and the employer and to a more complete analysis of the compensation which each of these two factors receive. The economic reasons why interest is paid for the use of capital might be summed up in the axiom that capital is the means of production."

To be specific the Commission has held that interest proper should include only the amount that is paid for

[1] *Hill et al., op. cit.*, 751-752.

[2] For a more detailed discussion *see State Journal Printing Co., op. cit.*, 635-637.

the use of the capital employed, while profits consist of the wages of management, broadly interpreted, of compensation for the risks and responsibilities that must be borne by the employers, "and of such other compensation, if any, as may be demanded by the conditions."[1]

Under the terms of the Wisconsin Public Utility Law, which make a fair valuation of the physical property the basis of rates and returns, excessive capitalization cannot justify higher than reasonable returns. It has been repeatedly held by the Commission that the fact that excessive amounts of securities may have been issued and that rates, before the period of state regulation, may have been high enough to justify the same, would not justify it in approving them, if they had been found unreasonable in other respects.[2]

Rate of return is not a constant, definite factor. The law says it must under normal conditions be reasonable.[3] The rate itself is left to the judgment of the Commission to determine. Opinions as to the judgment of a return which is "reasonable" represent two extremes. By some it is argued that the rate of interest and profit allowed on an investment should not exceed that at which the government could obtain the money, if it owned and operated the facilities. Others contend that no restrictions should be placed upon the returns that can be earned by rates for service based on all that the traffic will bear. Judged by the opinions of the Commission neither contention is just. It finds the rate of return located somewhere between these two limits, depending upon the character of the utility, the stability of its business, local conditions under which it is operated, the hazards of the enter-

[1] *Hill et al., op. cit.*, 764, 998; *City of Milwaukee* v. *T. M. E. R. & L. Co.*, 1912, 10 W. R. C. R., 240, 859.

[2] *Hill et al.* 726-727, 997.

[3] *Ringle et al.* v. *C. M. & St. P. R. Co. et al.*, 1911, 7 W. R. C. R., 180, 860.

prise and the limitations fixed by the terms and spirit of the Public Utility Law.[1] Profits as a factor in the amount of return depend on these and other elements to be discussed later.

The rate of interest allowed on the investment depends first upon the character of the utility. As a general rule the Commission has found that investments in water plants are the safest, followed by gas and electric concerns.[2] Telephone investments are the least secure. Inventions in water-works plants are few; in the telephone field improvements are constantly being made. "As water works, generally speaking, are among the safest of undertakings, when once they have reached a paying basis, safer in fact than most other local utilities, the speculative gains therein should be comparatively low,"[3] says the Commission in one case. Again in discussing the telephone situation in another decision it said: "Even though the patronage and revenues of a telephone company remain stable and business increases in times of depression, the telephone business, in the present state of the art, nevertheless remains a business subject to great risks and uncertainties. It may be only a few years more before large parts of the existing plants will be discarded because of better service which new inventions can afford. There are those who believe that the manual central energy system will give way to the automatic, just as the magneto board was displaced by the common battery board."[4]

A second factor considered by the Commission is the stability of the business. It finds that the rate of interest charged during the period of construction, or on a new plant that is just developing, is greater than for an older

[1] Howard T. Lewis, "Interest and Profits in Rate Regulation," *Political Science Quarterly*, XXVII, 244.

[2] *State Journal et al., op. cit.*, 632-647.

[3] *Hill et al., op. cit.*, 761.

[4] *Payne et al., op. cit.*, 67.

plant already established as a paying proposition. Its views are well expressed in the following extract from a decision:

To permit relatively high rates during the experimental[1] period of public utilities is often both necessary and in line with good policy in other respects. Without it the necessary capital may not be forthcoming at all. . . . Older and better established utilities can secure money for extensions at lower rates than new utilities. This applies also in renewing their bond issues and other loans. In many cases they are even able to refund outstanding bond issues at much more favorable rates of interest than the rates paid in the past. In view of this it is clear that there should be a gradual decline in the rates of interest of such plants. This is also an important fact, for it is undoubtedly the case that the rate of interest actually paid is one of the elements that should be taken into account in considering all interest allowances on the investment.

Local conditions under which a plant is operated are another element that cannot be disregarded. If the utility is owned by the municipality it can obtain capital at lower terms than a private plant, or perhaps, if privately owned, its management and the community may be estranged and harsh ordinances may burden it. Again the local management may be efficient, but the plant may have been built in advance of the needs of the community. Full cognizance of all of these local conditions is taken by the Commission as illustrated from the views expressed in four different decisions:

As to the rate of interest to be allowed, there is reason[1] for making a distinction between privately and publicly owned utili-

[1] *Hill et al., op. cit.*, 726, 762, 997; *Also see City of Milwaukee* v. *T. M. E. R. & L. Co.*, 1912, 10 W. R. C. R., 241; *In re Fond du Lac Water Co.* 1910, 5 W. R. C. R., 482, 506; *State Journal et al., op. cit.*, 501, 629.

[1] *Dick et al.* v. *Madison Water Commission*, 1910, 5 W. R. C. R., 745, 897.

ties. If the same rate of return were to be allowed, other things being equal, the consumer would hardly have any advantage in taking service from a municipal plant. But a difference in the rate of interest will give him all advantage in taking service from a municipal plant. In the present case the city pays 3½ to 4 per cent interest on the bonds issued to cover the water plant. A private plant would demand at least 6 per cent or more. If the city is permitted a return of 4 per cent on the investment, the saving in interest over a privately owned plant on a 6 per cent basis amounts to a considerable sum.

Bonds ought to sell at par. This is certainly the case[1] when the bonds amount to less than the cost value of the plant, or for public utilities which have passed the development period and the earnings of which are ample to cover all legitimate demands that are made upon them. But such securities do not often sell at such prices. For this local conditions are often responsible. For instance, the relation between the plant and the community may be strained or irritating. This relation may be as embarrassing and harmful when caused by political agitation and strife as when due to lack of tact or to arbitrary methods on the part of the management of the plant.

It would seem that when a utility undertakes to build[2] considerably in advance of the needs of the community, the utility can hardly expect a large return upon this investment immediately.

The rate of profits depends upon the supply of business[3] capacity and initiative, the risks involved, the nature of the undertakings, and many other conditions. These rates, therefore, vary as between the different industries and the different classes of service. They even vary as between the various public utilities in the same place, as well as often also between like utilities in different localities.

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[1] *Hill et al.* v. *Antigo Water Co., op. cit.*, 754.

[2] *City of Beloit* v. *Beloit W. G. & El. Co.*, 1911, 7 W. R. C. R., 347, 861.

[3] *Superior Commercial Club et al.* v. *Superior W. L. & P. Co.*, 1912, 10 W. R. C. R., 758, 861.

The influence of risk, or the hazard of the business, on an interest rate seems so self-evident in all lines of industry as to need little comment. The less the risk the lower the rate, and vice versa. Postal savings deposits, for example, because of the lack of risk, draw a low rate of interest. This risk is lessened where competition does not exist as in the case of most utility plants. In every decision affecting a rate of return the risk is pointed out as an element that affects the rate for both interest and profits. Thus the Commission says:

> As the rate of interest or profits is largely [1] dependent upon the risks it would seem to follow that the rate of interest should be lower in monopolistic than in competitive enterprises. This position is also strengthened when, as for public utilities, reasonable returns are recognized by law.

The concluding factor bearing on the rate of interest is the effect the provisions of the Public Utility Law have on the enterprise regulated. Competition is largely eliminated through the indeterminate permit statute—a fact that gives greater security to the bonds of a company. The Commission pointed out in an early case [2] that the effect of the law would be to lower the rate of interest. According to some utility managers this has already been accomplished. Under the indeterminate permit law, applicable to all utilities, no new competition is allowed unless public convenience and necessity demand it. How these provisions of the Public Utility Law influence the interest rate is suggested in the following statement from the Commission's decision:

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[1] *In re Menominee & Marinette Lt. & Tr. Co.*, 1909, 3 W. R. C. R., 819, 998.

[2] *Payne et al. v. Wis. Tel. Co.*, 1909, 4 W. R. C. R., 63-64.

Under the laws of Wisconsin, public utilities, under ordinary[1] conditions, are entitled to earnings for their service that will yield enough to cover operating expenses, including depreciation and a reasonable return on the property actually used and useful for the convenience of the public.

These are the five specific factors taken into account in determining the rate of interest. There are other general conditions that must be satisfied. Thus the Commission says:

The reasonable rate of interest is the rate that under[2] the conditions is fair to both investors and consumers. The minimum rate, in such cases, should be limited to the rate at which capital could be had, but this rule is perhaps more applicable to new investments than to investments already made, although it is not without influence in the latter case. The reasonable rate of interest and profit can, perhaps, be said to be a rate that closely approximates the returns that are received on capital investment in other undertakings where the risks involved and other conditions are similar. Measured by this standard, these rates would be higher where the plants are new, or where the risks are greater, than later on when the business has become more firmly established. It would also be greater than the rates obtained on money invested in mortgages or in other places where the risks are comparatively low.

As indicated by the above statement the Commission finds in determining upon the rate of return that it is necessary to "closely approximate the returns that are received from capital invested in other undertakings." This entails an investigation of the investment and industrial situation generally. All of the elements that may affect business conditions must be considered. It is axiomatic to say that no state can set up a standard of its

[1] *State Journal, etc., op. cit.*, 623, 897.

[2] *In re Menominee & Marinette Lt. & Tr. Co.*, 1909, 3 W. R. C. R., 793, 794, 998.

own.[1] Interest rates are determined by the general financial market. Capital, being largely mobile, is controlled by general laws.

Such investigations conducted by the Commission into general and financial conditions show that from 1873 to 1896 there was a gradual decline in prices[2] and that since the latter date prices have gradually risen and the dollar has depreciated in value until now it is worth about 60 per cent of what it was worth in 1900. Few people realize how rapid this decline has been.

If the price level of 1900 in the North Central States is represented by 100, investigations of the United States

RELATIVE FOOD PRICES, COST OF A YEAR'S SUPPLY OF FOOD, AND RELATIVE PURCHASING POWER OF MONEY, 1900–1913.*
(North Central States)

	Relative prices of food	Cost of a year's supply of food for average workingman's family	Relative purchasing power of money
1900	100.0	$301	100.0
1901	107.0	322	93.5
1902	112.6	339	88.8
1903	112.6	339	88.8
1904	113.3	341	88.3
1905	113.6	342	88.0
1906	117.6	354	85.0
1907	122.9	370	81.2
1908	128.2	386	78.0
1909	135.9	409	73.6
1910	143.5	432	69.7
1911	140.8	426	71.0
1912	153.8	463	65.0
1913†	166.5	501	60.0

* Table taken from article by Prof. T. S. Adams on "Investing in Service," *La Follette's Weekly*, Jan. 31, 1914.

† August.

[1] *Payne et al., op. cit.* 63.

[2] Commissioner Erickson, Unpublished address on "Returns for Interest and Profits."

Department of Labor show that the relative prices of food had risen by August, 1913, to 166.5 and that the purchasing power of money had correspondingly declined about forty per cent. This is undoubtedly an important factor to be considered in explaining the general, yet almost imperceptible, rise in interest rates in the past few years. The facts relating to the increase in prices and the decline in the value of the dollar are presented in the preceding table.

Commissioner Erickson's investigations indicate that the interest rates are not as high as they were in 1890, but that the increase in prices during the past few years has had important effects. It was found that for the two-year period from 1900 to 1902 there was a decline in interest rates followed by a steady increase since 1904 that is still unchecked. Bonds of ten leading railroads were selling on a 2.72-per-cent interest basis in 1891, on a 3.92-per-cent basis in 1904 and on a 4.23-per-cent basis in 1912. On the New York exchange the percentage of bonds bearing less than 4 per cent is rapidly decreasing. Quotations from bond houses, illustrating this gradual increase in the cost of capital, might be multiplied indefinitely. The volume of business transacted has been greater than for corresponding previous periods. This has stimulated the call for capital and correspondingly raised the rate of interest which varies with the demand. The financial world calculates these demands with precision. Frank A. Vanderlip, president of the National City Bank of New York, estimated in 1913 that it would require an annual expenditure of $400,000,000 for the next five years to develop the electrical industry. As illustrating the magnitude of future financial problems the following statement by him is worthy of careful consideration:[1]

[1] Vanderlip, Address on "Financing Electricity," Sept. 5, 1913, at Association Island, N. Y., 4.

When the matter is put so concretely as a new $8,000,000 capital every week for five years, the size of your financial problem can be readily grasped. To get a full appreciation of the difficulties, you may well glance outside of your own field, however, and note that there will mature within the next five-year period well over $1,000,000,000 of steam railroad securities. We may well note, too, that railroad development in the last five years called for from $2,500,000,000 to $3,000,000,000 of new capital, and I would say that there is every reason to expect at least as great demands, in addition to the refunding operations, in the next five years. The railroads then in five years will need, say, $4,000,000,000 for refunding and fresh capital. States and municipalities, should they take no more new capital in the next five years than they have in the last five, will absorb in the neighborhood of $1,500,000,000 more.

These specific and general factors must be considered by a commission in fixing a rate of return that shall be reasonable to the utility and the public, and yet be high enough to attract capital for development. Economic laws governing rates of interest have been more scientifically worked out than those limiting the rates of profit. Distinct profit rewards are more individualistic. They are based more particularly on the skill of management: gains due to change, speculative gains from risks assumed, returns from shrewd bargaining, the wages of management,[1] "and other conditions of this nature including monopoly powers."

Except possibly the amount allowed for wages of management these elements are self-explanatory. Their relationship to profits have been presented at length in the case of the *State Journal Printing Company, et al.*, v. *The Madison Gas & Electric Company*, which deserves a careful perusal for a more complete understanding of the factors.

[1] *State Journal, op. cit.*, 637; *In re Fond du Lac Water Co.*, 1910, 5 W. R. C. R., 506, 897.

Excessive general office salaries are considered as profits. The Commission favors high-grade service but does not approve of salaries for management or superintendence that are not commensurate with the duties performed. "When no[1] more is paid than the amount that is sufficient to insure proper and efficient service, there is little to be said regarding the salaries paid," says the Commission in discussing the relation of profits to the wages of management. "If, on the other hand, the salaries are kept at an unreasonably high level in order to cover up earnings, or for some other reason of this nature, there may be good ground for criticism." It further holds, however, that "allowance should be made in some manner for special efficiency. To deny this is to take away one of the greatest incentives to economy."[2]

As a general proposition, it may be said that the Wisconsin Commission allows a rate of return as profit and interest, equal, as nearly as it is possible to ascertain, to what the same company would earn under similar circumstances in competitive conditions. Its views are thus summarized:

In a general way the reasonable return may be said[3] to be that rate of return at which capital and business ability can be had for development. Theoretically it cannot be lower than this, for in that case no capital would enter the field. Under free competition it could not, in the long run, be higher than this figure, for if it was, the supply of capital for these purposes would be increased and this increase, in turn, would tend to reduce the rate of profits and interest. But free competition is

[1] *In re Joint Application Waupaca El. Lt. & R. Co.*, and *Waupaca*, 1912, 8 W. R. C. R., 613, 841; *City of Janesville* v. *Janesville Water Co.*, 1911, 7 W. R. C. R., 647, 861.

[2] *City of Milwaukee* v. *T. M. E. R. & L. Co.*, 1912, 10 W. R. C. R., 242, 861.

[3] *In re Menominee & Marinette Lt. & Tr. Co.*, 1909, 3 W. R. C. R., 793, 996.

out of the question in the case of such utilities, for they are monopolistic in their nature. It is for this reason that in the case of such monopolies the term "reasonable" has been substituted for the conditions otherwise brought about through competition. Since competition did not exist, it could not regulate, hence some other regulating force had to be resorted to. This form is implied in regulation through absolute legislation, and this regulation is guided by what is reasonable under the circumstances. To determine what is reasonable in any given case is a matter of investigation and judgment.

Plants that will not yield returns under such conditions are not allowed a profit. "Undoubtedly the utility is entitled to a reasonable return upon the value of its property," comments the Commission in one case,[1] "but if the attempt to enforce rates which will yield such a return is to lead to a decrease in the number of customers and resulting decrease in revenues, any theories as to the proper return on property must give way to the practical situation." Public interests are placed above private interests.[2]

Under normal circumstances, the Commission allows the following rates, which include both interest and profits:

Railroads	about 7 per cent
Gas works	about 7 per cent
Street railways	about 7.5 per cent
Water works	6 to 7 per cent
Electric plants	7.5 to 8 per cent
Telephone companies	7.5 to 8 per cent

Both railroad and utility managers charge that such returns are "niggardly." Interest rates alone average about 5 per cent, leaving but a narrow margin for actual profit. Under these allowances, however, new capital has entered the field and the enterprises regulated have devel-

[1] *In re Application Oconto Water Supply Co.*, 1911, 7 W. R. C. R., 556, 557, 861.

[2] *Rio River Land Co.* v. *Upham Mfg. Co.*, 1901, 1 W. R. C. R., 754.

oped at a normal ratio with other states. What the future may bring in the way of increases or decreases of the rate of return cannot be foretold until the economic facts themselves have appeared. The application of the principles to these facts will then show what is the "reasonable" rate of return under the conditions then existing.

CHAPTER V

STANDARDIZATION OF SERVICE

The Wisconsin law requires and the Commission insists that the first duty of a utility is to furnish adequate service, even though a poorer class of service could be supplied at a lower rate. After service conditions have been improved, rate questions are considered. Poor service is uneconomical to the consumer. It is the source of a majority of the complaints against a utility.

That the railroads and public utilities may better understand the character of the service required, definite service rules have been published from time to time. Conformity with this "code of morals" is enforced by the Commission. With steam and electric railways and water works the service is maintained at a fair level of efficiency. Complete standards for electric and gas service were promulgated [1] by the Commission on July 24, 1908, following the provisions of the Public Utility Law.[2] After five years of administration these were improved and announced in revised form,[3] August 9, 1913. Service rules for telephone companies [4] were issued on August 13, 1914, after a public hearing attended by representatives of nearly all of the

[1] *In re Standards for Gas and Electric Service*, 2 W. R. C. R., 632.

[2] Sec. 1797m-23, ch. 499, Laws of 1907.

[3] *In re Standards for Gas and Electric Service*, 12 W. R. C. R., No. U-233.

[4] *In re Investigation on Motion of the Commission of Standards for Telephone Service in the State of Wisconsin*, 15 W. R. C. R., No. U-339.

telephone companies operating in the state. The announced standards of service are enforced through a system of constant inspection and supervision by the Commission's staff. For this purpose the state is divided into districts, in each of which a traveling representative makes daily service tests and reports conditions to the Commission. Inadequacies are then reported to the utility with directions for improvements. Refusal to comply would result in the assessment of the heavy penalties provided by the law.

Because Wisconsin was one of the first states to fix definite standards for public utility service and the very first to include more than two or three of the elements that make up adequate service, its original investigation is of great importance. It covered a study of the requirements in various countries, states and cities, with a comprehensive investigation of the service furnished by Wisconsin utilities. As illustrating the wide variety of conditions, the record of tests made upon various gas plants in the state showed "a range of heating values between the limits of 193 and 1,050 B.T.U. per cubic foot, the majority of tests showing a value of about 600." When the gas and electric standards were first announced few of the plants were able to comply with them without making additions and improvements. Hundreds of thousands of dollars were expended by both the private and municipal utilities in developing their plants to give the efficiency of service required.[1]

RAILROAD SERVICE

In the case of steam railroads, questions of service involve the close connection at junction points between the same and different systems; the stoppage of a sufficient

[1] John H. Roemer, Address at Kansas City, Nov. 16, 1911, 14.

number of trains at the smaller stations; the cleanliness, convenience and sanitation of the cars and depots; the equitable distribution of freight cars among shippers at all points, and the equipment of the system with improved safety devices to prevent needless accidents. The latter involves the question of protecting dangerous crossings and the separation of grades. The yards, bridges, tracks and rolling stock of the roads are under constant inspection by members of the Commission's engineering staff, that defects may be eliminated and the handling of both freight and passengers facilitated through the adoption of better methods.

Each of these separate problems requires intricate details of study and investigation. The consideration of the inadequacy of station facilities, for example, involves the study of the population served, the approximate cost of the improvement, the possible resulting increase of business and other operating factors. If the service and convenience of the public require it, the Commission may even order the construction of union passenger stations.[1] Such questions are usually decided as the result of a formal complaint and hearing. Again, under the provisions of the spur track law, the constitutionality of which has been sustained by the state and federal courts, the Commission may order the construction of a track, not more than three miles in length, to an industrial plant, if the improvement is indispensable to business and is not dangerous to the public. Other service matters considered are the inspection of block signal and interlocking plants, the inspection of tracks, and the investigation of delays, accidents and wrecks. These problems arising in industrial centers lead to many complaints, a majority of which are settled without formal orders.

[1] Ch. 69, Laws of 1913; *also Howard Teasdale* v. *C. M. & St. P. R. Co.*, and *C. & N. W. R. Co.*, 1914, 13 W. R. C. R., No. R-805.

STREET AND INTERURBAN RAILWAYS

The most complete investigations of the electric railway service have been conducted on the lines in the city of Milwaukee, where the congested condition of downtown districts raised problems that did not menace the smaller cities of the state. Studies of service in all of the cities have been made. These have culminated in orders for the rerouting of cars, the maintenance of faster schedules, limitations of loading, the granting of permission to carry folded baby cabs on the rear of cars, and other services.

Investigations of this character usually involve observations by inspectors taken simultaneously at different parts of the system, together with conditions and difficulties at transfer points. Generally these observations are made secretly. The data gathered includes the number of passengers traveling, the crowding of cars, the number of transfers issued, the speed and interruptions of service that cause delay. When this material is assembled and charted for successive days and for different hours, the weaknesses in the existing arrangements appear in sufficiently definite form to permit analysis and remedy. At Madison, Superior and Milwaukee these investigations have resulted in the complete rerouting of cars, the ordering of additional equipment and more cars for service at the rush periods in the morning, noon and evening.

Under the law [1] passed by the 1913 legislature the Commission is given power to require the joint use of tracks of different companies at a compensation to be determined by it, that the public may be adequately served.

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[1] Ch. 62, Laws of 1913; *also T. M. E. R. & L. Co.* v. *Milwaukee Northern Railway Co.*, 1913, 13 W. R. C. R., 268, and *T. M. E. R. & L. Co.* v. *Chicago & Milwaukee Elec. R. Co.*, 1913, 13 W. R. C. R., 299.

WATER WORKS

Purity of water supply, adequacy of the source, the pressure on the mains for domestic, industrial and public service, the accuracy of meters,[1] are among the water-works problems that demand the attention of the Commission. About 80 per cent of the water works in the state are municipal plants. Fire tests made in a number of cities have resulted in the ordering of immediate plant improvements, that adequate fire protection might be maintained. Because of polluted water it has been found necessary to order a change in the source of supply.[2] The numerous decisions of the Commission affecting water works show that sometimes it has been necessary to order plants to extend service to the curb line of lots and in other cases to build mains into unsupplied districts,[3] to obviate disaster in residence sections in case of fire. No general standards for heating plants have ever been promulgated, although individual features have received attention from time to time and assistance has been rendered where rules governing heating service were being drawn up by utilities.

ELECTRIC LIGHTING SERVICE

The requirements for gas and electric service are more specific. In determining the electric standards, the Commission formulated rules which did not lay stress on any one element to the neglect of others; nor are the standards so high as to compel the smaller lighting utilities to demand high rates because of the requirements.[4] The revised

[1] *In re Investigation Hudson Municipal Water Works*, 1908, 3 W. R. C. R., 141.

[2] *Torrance et al.* v. *La Crosse Board of Water Commissioners*, 1911, 7 W. R. C. R., 39, 40, 85.

[3] *City of Janesville* v. *Janesville Water Co.*, 1911, 7 W. R. C. R., 707, 708, 884; *also Beloit, Madison & Lake Mills* cases.

[4] *In re Standards*, etc. Aug. 9, 1913, 9.

standards of August 9, 1913, direct electric companies to test meters on installation and at stated intervals thereafter, depending upon the type and characteristics of the meter. During any six months' period, consumers who believe their meters are inaccurate may, on application, have retests made by the utility without expense. If not satisfied with the utility's test, or if they so prefer, the Commission's engineering staff will make a test upon application, for which a nominal fee is charged. If the meter is slow or correct, the fee is paid by the consumer. If fast beyond the allowable limit of 4 per cent, the utility pays the expense. All companies are required to have suitable meter-testing equipment, and to keep complete records of all tests made. Bills rendered to customers shall designate the reading of the meter at the beginning and end of the period for which it is rendered.

In addition to the meter inspection, which some cities maintained before standards were promulgated for the state, the Commission requires each company to keep a record of interruptions in service and to make reasonable efforts to eliminate interruptions, and whenever they occur, service must be reëstablished with the shortest possible delay. It defines as an interruption a period of over 30 seconds during which the voltage on the circuit is less than 80 per cent of its normal value. The rules require that an operating log be kept in each plant. By the Commission following these various records closely, the improvement made in the service furnished by many utilities has been marked. Another rule provides that the voltage supplied at any consumer's cut-out shall remain constant within prescribed limits. The company is also required to make frequent inspection of incandescent lamps, and to inform each of its consumers "as to the conditions under which efficient service may be secured from its system."

At present there are over 350 electric lighting plants whose service is regularly inspected by members of the Commission's staff. These inspectors carry testing equipment and take graphic records of voltage over the distribution systems, calibrate the company's standard instrument, and supervise the testing of consumers' meters and the renewals of incandescent lamps. After the recording instruments have run over night, the inspector visits the plant to look over the meter and station records. A complete report of all information gathered is then sent to the main office at Madison, together with the original record taken by means of the recording instruments. The utility is in turn notified by the Commission of the necessary changes, and these suggestions are followed up by later inspection to see that the standards are enforced. In nearly all plants sufficient improvements were made without summoning the operators before the Commission to explain their derelictions.

As a result of this inspection and standardization of service great improvements in voltage conditions have taken place in the electric utilities of the state. When the law was enacted, out of 238 plants then furnishing service to 75,000 consumers, only about 15, serving 15,000 users, furnished satisfactory voltage. Inadequate voltage service was given to 60,000 consumers. At least forty plants have since been generally overhauled, besides the general mechanical improvements made in other electric utilities. Probably the greatest improvement has been brought about by the additional care with which utilities have been operated since these matters have been emphasized. The Commission's inspection staff estimates that practically all of the present 100,000 electric consumers in the state "are now receiving satisfactory electric service as measured by Wisconsin standards. In this connection it must be borne in mind that the state regulation of voltage is new, and

that work similar to this in scope has never before been attempted."

When the standards were first announced, less than a dozen companies, serving approximately 12,000 consumers, were inspecting their meters.[1] Practically every plant in the state now has instruments for doing this work.

The engineering staff has estimated the financial gains to the public as a result of standards and inspections as follows:

> Assuming that the improvement in voltage regulation brought about by enforcing the rules of service has been worth 5 per cent of the bills to the other 60,000 consumers now getting good service regulation, and that the remaining 40,000 have received a 1 per cent benefit due to raising the standard of regulation, shows a saving of $122,400 per annum on the basis of average bills of $3.00 per month. At present practically all electric meters are tested systematically; at least 60,000 are now tested which did not receive such tests five years ago. If this is worth 1 per cent to the consumer, the total value of the work has been $21,600 per annum. This gives a total of $144,000 saved to the electric lighting consumers of the state each year because of the regulation of electric service.

GAS SERVICE

The gas standard requirements are similar to those which were promulgated simultaneously for electric plants. No gas meter is allowed to remain in service unless it registers within 2 per cent correct. Meters must be tested at installation and may remain in service a maximum of four years between tests. Request and referee tests are made on application under similar rules as applied to electric companies.

The monthly average for the heating value of gas shall

[1] Report of inspectors to Commission (unpublished), Oct. 18, 1911.

not be less than 600 British thermal units per cubic foot, and the minimum shall never fall below 550. These tests are to be made anywhere within a radius of one mile from the distribution plant. Large plants with an annual output of 20,000,000 cubic feet of gas, or over, shall be equipped with standard instruments for measuring heat value, and shall make tests at least three days a week. Because no gas is utilized in open-flame burners in Wisconsin a candle-power standard is not considered necessary. Another rule prescribes that the gas pressure shall be such as to support from two to six inches of water "and the maximum pressure at any outlet on the system shall never be greater than double the minimum pressure at that outlet." The purity of gas is controlled by allowing not more than thirty grains of total sulphur for every one hundred cubic feet and not more than a trace of sulphuretted hydrogen. A complete record of all complaints and their remedy shall be kept by the company open to public inspection.

The service of these plants is regularly inspected by the Commission's staff. In addition to the regular gas plants there are a number of gasoline and acetylene plants that require occasional visits for assistance in operating matters.

The thirty-six regular gas plants in the state furnish service for approximately 125,000 consumers. In the six years that standards and state inspections have been effective, the heat value of the eleven plants has increased more than 10 per cent. In one case it has increased 30 per cent. Two plants have increased heat value between 5 and 10 per cent, and five plants between 2 and 5 per cent. The pressure was inadequate in twelve plants. In thirteen cities having gas service no systematic meter inspection was carried on. A conservative estimate prepared by the engineering and inspection staffs on October 18, 1911, for each city individually, showed a total saving to

the gas consumers of the state of $45,000 per annum[1] as a result of standardization of service.

TELEPHONE SERVICE

Definite standards of telephone service were first outlined when a member of the Commission's engineering staff presented a tentative set of rules[2] in the state convention of telephone men held in Madison in February, 1913. After these preliminary rules were discussed and revised, two public hearings on the subject were conducted by the Commission and as a result a formal order was issued August 13, 1914, establishing standards of telephone service. These rules require that equipment and lines shall be properly maintained; that "cross-talk" and noise unreasonably interfering with the service shall be eliminated and that lines shall not be overloaded by connecting more subscribers to a single line than can be adequately served. Telephone utilities are required to supply lines for through traffic between cities and villages, to which few if any subscribers are permanently connected. The companies are required to make such tests and inspections as are necessary to satisfy the Commission and the public that they are complying with the rules. Each company is required to have sufficient switchboard capacity and operating force and to make reasonable provision to meet emergencies. Ten seconds is given as the period within which 90 to 94 per cent of all calls must be answered by telephone operators, the larger exchanges answering at least 94 per cent within that time. Directories are to be revised annually or semi-annually, depending upon the size of the

[1] These facts are taken from a report of inspectors to Commission (unpublished).

[2] J. N. Cadby, "Definite Standards of Telephone Service," Address before Wisconsin State Telephone Association, Feb. 12, 1913.

exchange and the number of changes taking place. The directories must contain instructions and rules governing the use of local and toll service sufficient to inform all users of their rights and obligations. Although no definite rules governing toll service are included a number of suggestions are given which should serve as a guide in toll service operation.

The routine inspection in connection with these rules is to be carried on in the manner similar to that employed before the rules were adopted. As in the case of electric and gas service, inspections heretofore have been made upon complaint and since 1910, regular inspections by the Commission's staff have been conducted annually at some forty-two of the larger exchanges, serving about 82,000 subscribers. A regular telephone inspector makes from thirty to one hundred inspection calls from different telephones before reporting to the utility's office to check over the service records. Every inspector and representative of the Railroad Commission assists in this work by carrying a split second stop watch that records the time required to get the operator and the party. Regular reports, made to the Commission's office at Madison, show such irregularities as wrong numbers given, poor supervision of calls, indistinct transmission, and any complaints of subscribers. The Commission immediately informs the company of the results of the inspection with suggested changes to secure improved service. The Commission's suggestions to the utility are accompanied with blue-print curves showing the results of all former inspections of the plant with a graphic comparison of the service furnished by telephone utilities in other cities of the same class. Unless corrections are made within reasonable time, the Commission issues a formal order against the company.

State supervision is becoming effective. Tests during the fiscal year ending June 30, 1912, in thirty-one cities of

the state show that it required an average time of 4.5 seconds to get the operator, while the minimum was 3.2 seconds, and the maximum 11.7 seconds.

The requirements of the Commission have resulted in extensive telephone improvements in the state. Many of the lines have been changed from grounded to metallic circuits at great expense, occasionally necessitating an increase of rates. Of thirty-two orders of the Commission authorizing public utility rate increases, in the five years up to August 20, 1912, twenty related to telephone plants where the advance was necessary because of the better grade of service furnished.

CHAPTER VI

UNIFORM ACCOUNTING

In considering the matter of public utility regulation the necessity of proper accounting cannot be overemphasized. It is recognized, however, that public service company accounting as a science had been given but little consideration before the beginning of the twentieth century. This was largely due to the fact that the interests before that time centered primarily around the cash account, and the records were naturally kept in such a manner that the honesty of officials and employees might be shown. Accounting with these purposes in view meant a record system that would show receipts and disbursements, with certain checks so as to prevent misuse of the revenues. While this is an important feature in any system of accounts, it does not furnish the information along accounting lines as required at the present time. Accounting as understood to-day, and to be of the greatest service, must give a comprehensive idea of the condition of the business. The present conception of accounting is well brought out by William Morse Cole in his book, "Accounts, Their Construction and Interpretation,"[1] in which he says:

"Accounting, in the sense in which it is used here, is scientific analysis and record of business transactions. It attempts to tell about every transaction everything that can be of service when known. It attempts to show the result of every effort, the cost of every return. Only by

[1] Pp. 4-5.

its aid can satisfactory comparison be made of different enterprises and different methods."

In manufacturing industries the necessity of having a comprehensive knowledge of the cost of production is now well recognized. Heretofore increases in expenses were met by an expansion or increase of sales. Competition, of late, however, has forced men to realize that increases in sales do not necessarily continue to give profits in proportion to the extra cost involved in putting the products on the market. The only logical solution under these competitive conditions is to economize in the cost of production. Under normal competitive conditions, cost more than any other element fixes the price or determines the profits to be made. A knowledge of the costs of the various articles produced has now become imperative, and this demands a change from the old to the present system of accounting.

The importance of proper accounting for public utilities can be more fully realized when it is remembered that regulation of public utilities has for one of its main functions the determination of what constitutes a reasonable rate of return to the utilities. It is obvious that a public body cannot determine what constitutes a fair rate of return without having at its disposal ample information as to the revenues and expenses of the company. Such information must not only be a true representation of the affairs of the utility, but must also be presented in such form that it may be used to the utmost advantage.

This fact was recognized by those who drafted the Public Utility Law and ample powers were conferred upon the respective commissions for prescribing accounts and records suited to the needs of regulation. Section 1797m-8 to 16, inclusive, of the Public Utility Law of Wisconsin, for example, gives that Commission the power to prescribe the system of accounts to be kept and in addition makes it unlawful for utilities to keep any book accounts, papers

or records of business transacted, other than those prescribed or approved by the Commission. The wisdom of conferring this power upon the Commission has already been demonstrated by the results of its operation. This is obvious when it is remembered that regulation of public utilities to be effective is in large part dependent upon records kept in such a way that the results of operation and the true condition of the business may be shown. This end could not be accomplished without a central body controlling the accounting practices.

Without strict supervision in accounting matters difficulties are found along the following lines:

1. Records of construction are not kept separately from records of operating expenses.

2. No distinction is made in many cases between repairs and replacements.

3. In municipally owned utilities often no attempt is made to keep the records of the utility separated from those of the general business of the city.

4. Even where the expenses of operation are kept distinct from other items, the revenues and expenses are so improperly classified as not to permit of cost analysis.

With such conditions prevailing in the accounting practices one of the first problems confronting the public utility commissions after their organization was the adoption of a system of accounts which would afford the regulative agency a means of securing the information necessary for rate regulation.

The Railroad Commission of Wisconsin was one of the pioneers in working out a complete system of accounts for utilities designed to meet the demands of the operating men and supply the information for effective regulation. After two years of investigation following the passage of the Public Utility Law in 1907, a complete system of accounting and reports was promulgated applicable to all of the

utilities of the state. At the present time a large number of states have commission control of public utilities and have adopted accounting schemes for the various utilities. It is worthy of note that these systems follow the general policies laid down by the pioneer states in this work. By discussing the accounting schemes adopted by the Wisconsin Commission, therefore, a general understanding of the public utility accounting now in vogue will be gotten. The Wisconsin system is based upon the principles of cost accounting on a uniform plan.

The possibility of securing uniformity and at the same time of adhering to good accounting practice was simplified by building the classification around summary double-entry bookkeeping forms. By following this policy it was possible to adopt a system sufficiently flexible to provide for every variety of operating condition, and at the same time meet the needs of the smaller as well as the larger utilities. These forms are three in number: the balance sheet, the income statement and the profit and loss account. In the Wisconsin classification, the last two have been grouped under one account for convenience in submitting reports to the Commission.

The summary accounts in these forms are chosen along cost accounting lines so that the small utilities are allowed to group all items under the main divisions or controlling accounts without subdivision as to items, and for the larger utilities the summary accounts are further subdivided, the extent of the detail depending upon the size of the utilities. Under the scheme followed, the controlling accounts are maintained from the small Class D utility to the large Class A utility.

The controlling accounts in the balance sheet, on the one hand, showing the assets, consist of property and plant, treasury securities, investments, reserve and special fund assets, current assets, and prepared accounts, and, on the

other hand, showing the liabilities, consist of capital, mortgage, reserve, current and accrued liabilities. The excess of the assets over the liabilities under proper accounting conditions should show the undivided surplus in the business.

These accounts form the main structure in the balance sheet and are so general in character that subdivisions of the main accounts provide for sufficient flexibility to meet the varying operating conditions.

The income statement is purely an operating statement and follows the same policy in providing controlling accounts outlined above for the balance sheet. In this statement the summary or controlling accounts are the same for the small as for the larger utilities and provide that the small utilities be required to maintain only the controlling accounts, while a subdivision of each of these accounts is required in case of the larger operating companies.

The accounting arrangement of this form provides a statement of the operating revenues, then the operating expenses, after which the gross income is shown. This is a logical step, for it reveals the results of operation after all forms of operating expenses have been provided for. The deductions from gross income naturally follow next, which shows separately the costs incurred depending upon the manner of financing the business as revealed by the liability side of the balance sheet. Next in order comes net income or the profit or loss for the period, which is usually carried to form number three, the profit and loss account, but which is retained as part of the income statement according to the Wisconsin classification. The profit and loss account as the final form is intended to show the manner in which the profits, if any result from operation, have been disposed of. The profits may be used in the declaration of dividends or those in control may decide to use all or a part of the profits in building up the business.

Information disclosed in the income statement outlined above is essential in the matter of rate regulation. The widest use, however, depends upon a logical arrangement of the controlling accounts in conformity to the principles of cost accounting. This situation, it appears, has been successfully met in the Wisconsin classification.

Turning to the operating revenues, we find a careful arrangement of the revenues among the different branches of service furnished. The importance of this arrangement cannot be fully appreciated until a question of rates arises. It is then desirable to know how much each class of service has been contributing to meet the cost of rendering that class of service. With this information at hand, it will be possible to determine within reasonable bounds whether any class has contributed more or less than its just proportion of the revenues of the utility.

The subdivision of operating expenses constitutes the main point of difference among those who have given thought to uniform classification. It appears that the grouping of expenses should be determined primarily by the purposes to be attained by the classification and the information required to meet that purpose.

From the viewpoint of cost accounting, it seems reasonable to assume that the purpose should be to determine cost. This has been the assumption upon which the Wisconsin classification has been built up and these general account groupings have been widely used in the public utility field. It is appreciated that the cost of service principle has not been universally adopted as the proper basis for determining rates, still when considered from the standpoint of cost accounting it seems highly desirable to know the costs no matter what policy of rate regulation is adopted. Unless this policy is adhered to, it appears that the classifications are contrary to the accepted policies of cost accounting.

Keeping in mind the importance of knowing the cost of furnishing the different classes of service, the cost accounting principles were followed in grouping the operating expenses as far as practical along the successive steps in furnishing the service, while those which are overhead and cannot be assigned directly are placed in groupings by themselves so that when the question of rates arises, they may be distributed over the various services according to carefully worked out principles of apportionment. Experience has already demonstrated the wisdom of adhering to this policy, because in addition to making possible the determination of the cost of the various classes of service the system has met with unqualified success in maintaining uniformity.

The advantages and importance of uniformity in accounting are now generally recognized and it is being widely adopted in public and quasi-public undertakings. The element of uniformity is important to public service commissions to enable them to interpret the revenues and expenditures of a plant by contrasting them with other utilities of about equal size. Efficiency or inefficiency of management can most readily be shown through comparisons, item by item. In rate decisions much emphasis is put upon "normal" costs of operation or average costs of operation. The operating expenses upon which rates are based must be normal and reasonable. The reasonableness of the operating expenses of a given utility cannot readily be determined from the records of any individual utility. To determine what are normal operating expenses and what degree of efficiency in operation has been secured, the possibility of making comparisons is important. Whether or not the rates of a particular utility are reasonable cannot be judged from the amount of yearly profits. The total profit of a utility may not be excessive, but still the consumers as a whole may be treated unjustly, due to exces-

sive operating expenses caused by inefficient management. Whether or not a particular utility is being operated efficiently can best be determined by comparing its costs with other utilities producing the same product and operating under similar conditions.

In order to make the most satisfactory study of efficiency, the different costs must be expressed in terms of standard units. A study of unit costs is made possible under a uniform accounting arrangement. By "unit costs" is meant the cost of some one process or step in the production process reduced by some suitable division. Thus, for a water utility, the commonest unit of expense is the gallon; in a gas utility, cubic foot; and in the electric utility, the kilowatt hour. Of course, many other units for the measurement of costs are possible and are used, such as miles of main, number of meters, etc.

MUNICIPAL WATER UTILITIES—CLASS A

Detailed and Total Operating Expenses in Dollars per Million Gallons Pumped for Year Ending June 30, 1912

Location of company	Million gallons pumped	Total pumping	Total distribution	Total commercial	Total general	Total undistributed	Total operating expenses
Appleton	513	$16.58	$2.85	$0.62	$1.75	$0.75	$22.15
Eau Claire	730	7.80	5.18	2.12	1.31	.55	16.96
Kenosha	1,161	11.50	3.89	1.21	1.23	.17	18.00
La Crosse	1,025	15.91	5.05	.39	.84	.34	22.53
Madison	688	38.21	6.86	4.50	2.14	.61	52.32
Manitowoc	332	19.51	5.90	.38	1.88	.77	28.44
Milwaukee	17,024	6.69	3.66	3.32	1.34	.90	15.91
Sheboygan	1,121	11.52	2.62	.33	2.54	1.17	18.18
Watertown	304	25.25	6.99	2.23	4.35	.86	37.45
Waukesha	264	54.59	27.47	.33	7.38	.....	91.67
Wausau	841	12.64	2.07	.....	1.18	.38	16.60
Average	1,495	$20.94	$5.53	$1.85	$6.05	$0.89	$35.32

The preceding table taken from the records of the Commission illustrates the importance of such uniform unit cost comparisons.

This table compiled from uniform records shows not only the total cost per million gallons, but the expense of each successive step, as "pumping," "distribution," etc. Several of these plants show expense costs above the average. For one plant the total cost per million gallons of water pumped is $91.67, and in another $52.32, while the normal cost, according to other plants, is approximately $25.00. Considering these costs in detail, in the first instance, the total "pumpage costs" and the total "distribution costs" are above normal, while in the second instance costs appear normal, except for "total pumpage." These figures show the use of comparative unit costs. Although it would be unfair to assume immediately that these plants were being operated inefficiently, these figures do show along what lines a careful investigation of the plants should proceed. Such comparisons are of importance because they provide a means through which apparently abnormal costs can be detected and show just where careful investigations as to cost are necessary. Comparisons of this nature are not only possible for the plant as a whole, but for each step in the production process as well.

Although it is self-evident that no utility business can be successfully conducted without an accurate knowledge of the cost of rendering the service, it was surprising to find that as a rule the best conducted privately owned utilities had only in a measure recognized the importance of cost accounting systems, while municipally owned utilities had made no advancement along this line whatever when regulation first began. In this connection it may be said, however, that the accounting systems prescribed by the Commission, although differing materially from those formerly in vogue, have met with general approval among

managers of privately owned plants, and those of municipally owned plants who were inclined and in a position to administer the affairs of the plant on a sound business basis.

The local authorities in control of municipal utilities very naturally did not adopt the systems as readily as the privately owned utilities. This lack of efficiency has been due to various causes. The rotation in office, lack of administrative ability, and accounting knowledge, were among the chief causes. The Railroad Commission of Wisconsin recognized the difficulties of the utilities in this respect and has adopted means of assisting those utilities that find difficulty in conforming the accounting practices to the needs of the Commission. This assistance consists of prescribing the systems required in each instance and furnishing accountants for actual installation work. Under this method all utilities encountering difficulties are given an opportunity to secure the necessary accounting assistance. It is worthy of note that approximately 90 per cent of the applications for assistance and the actual installation work has been in connection with municipally owned plants. This is an encouraging situation, for it manifests a desire on the part of the municipalities to place the municipally owned plants on a firm business basis.

From the viewpoint of regulation, the inability of utilities to properly follow the advanced ideas along accounting lines has made the work difficult in many instances. In addition, it has caused numerous unjust questions regarding rates. It is of interest to both the utilities and the public that all utilities adhere strictly to the systems of accounts outlined by the various state commissions. With information kept in the proper manner, and as a matter of public record, there is no doubt that a great deal of misunderstanding between the utilities and the public will be eliminated.

CHAPTER VII

DEPRECIATION

State regulation has brought the subject of depreciation to the forefront with renewed interest. Both the public and the utility owners have begun to give thoughtful study to this question so that the operating expenses of a plant, which determine in a large degree scales of rates to the public, may be properly defined. When plants were small and owned by their operators the importance of depreciation was not so great. Now that the securities of these enterprises are sold on the open market in all parts of the country, the investor desires full information of all properties behind the equities and the plan and rate of depreciation by which these properties are to be kept intact.

By depreciation is meant the amount that must be set aside by an operating property to cover wear and tear, general decay, obsolescence and inadequacy. Depreciation begins as soon as a part of the plant is in place or completed, "and continues until it becomes useless or is displaced."[1] It may not represent an actual expenditure, but it is the amount that is set aside to offset the loss in value occurring to an operating plant. Theoretically, the sum reserved makes up the difference "between the value of the plant at any period after construction, although kept in good running condition by ordinary repairs, and the original cost value of the plant."

[1] *State Journal Printing Co. et al.* v. *Madison Gas & Electric Co.*, 1910, 4 W. R. C. R., 559, 818.

The nature of each of the elements that go to make up depreciation is about as follows: ordinary repairs, that are constantly being made in every plant, are designed to offset wear and tear. While in the nature of depreciation these items, which continue about the same year after year, are generally charged directly to the operating expenses, they are not always included in the depreciation allowance. General decay includes such changes as are caused by the action of the elements, commonly known as "decrepitude." These changes cannot be offset by ordinary repairs, but require the replacement of the entire unit. They affect all elements of tangible property with the exception of land. Through invention, and the development of the art, machines and methods of operation that were economical yesterday may be obsolete to-day.[1] One class of engine supersedes another, requiring changes in equipment; water power may be developed to take the place of steam or overhead wires may be ordered under ground—all these changes are elements of obsolescence that could not be foreseen by ordinary judgment, and must be covered by depreciation. Moreover, the city's population may have increased rapidly, requiring larger pumps, engines, equipment, or buildings for utility operation. The losses thus occasioned through inadequacy are proper elements to be taken into account in determining depreciation. By setting aside from the income a just amount for depreciation regularly, the original cost of the utility is maintained.[2]

"Depreciation is an element of expense just as much as wages, fuel, supplies, or any other element which is ordinarily charged to operation or maintenance of the plant."[3]

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[1] *In re Fond du Lac Water Co.*, 1910, 5 W. R. C. R., 515, 815.

[2] *Whitewater* v. *Whitewater El. Lt. Co.*, 1910, 6 W. R. C. R., 138.

[3] *In re Application Jefferson Municipal El. Lt. and Water Plant*, 1910, 5 W. R. C. R., 560.

Under the system of uniform accounting, required of all utilities by the Commission, it is treated as an operating expense. Differentiation is made, however, between repairs and depreciation. In a general way the uniform accounting plan provides that the "losses in value of all tangible property which lasts one or more years shall be charged to the depreciation account." Other property lasting less than one year and tools are covered by the maintenance and repair accounts. When the cost of the units renewed is greater than the original cost, the excess is charged to the construction accounts. With respect to the relation of depreciation charges to renewals the Commission has said:

> Depreciation is a regular charge, but the expenditures[1] of the depreciation fund are irregular. Thus it happens that there may be long periods in the life of a plant during which depreciation is accumulating, but when no renewals of any considerable proportions are made. Because of these and other similar reasons, it is seldom safe to assume that, during any given period, the depreciation and the renewals amount to about the same thing.

The rate of depreciation depends upon the character of the utility. A telephone plant goes to the scrap heap about five times as quick as a water utility and the annual percentage of depreciation to be charged off is correspondingly greater. These rates are illustrated by tables at the close of the chapter. From what has been said it must be evident that "the cost of general decay, obsolescence and inadequacy, being irregular, . . . should be provided for in advance by charging each year's expense through depreciation with its pro rata proportion."[2]

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[1] *State Journal Printing Co. et al.* v. *Madison Gas & Electric Co.*, *op. cit.*, 559.

[2] Commissioner Erickson, Address delivered before the Convention of Central Water Works Association, Detroit, Mich., Sept. 25, 1912,

In business it is the accepted practice that depreciation must be provided for. A plant that is not earning enough to meet depreciation is a losing proposition, whether it is operated by a municipality or under private management.[1] The only difference between the two classes of management is that the deficiencies of the former are oftener met through public taxation and in the latter the losses fall upon the stockholders. This state of affairs is sought to be corrected by the Wisconsin Public Utility Law which provides that:

1. Every public utility shall carry a proper and adequate depreciation [2] account whenever the commission after investigation shall determine that such depreciation account can be reasonably required. The commission shall ascertain and determine what are the proper and adequate rates of depreciation of the several classes of property of each public utility. The rates shall be such as will provide the amounts required over and above the expense of maintenance, to keep such property in a state of efficiency corresponding to the progress of the industry. Each public utility shall conform its depreciation accounts to such rates so ascertained and determined by the commission. The commission may make changes in such rates of depreciation from time to time as it may find to be necessary.

2. The commission shall also prescribe rules, regulations and forms of accounts regarding such depreciation which the public utility is required to carry into effect.

3. The commission shall provide for such depreciation in fixing the rates, tolls and charges to be paid by the public.

4. All moneys thus provided for shall be set aside out of the earnings and carried in a depreciation fund. The moneys in this fund may be expended in new construction, extensions or addi-

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p. 9. Much of the information used in this chapter is based on the data in this paper and recent depreciation tables prepared under direction of Mr. Erickson.

[1] *Dodgeville* v. *Dodgeville El. Lt. & Power Co.*, 1908, 2 W. R. C. R., 406.

[2] Sec. 1797m-15 (Ch. 499, Laws of 1907), Statutes of 1913.

tions to the property of such public utility, or invested, and if invested the income from the investments shall also be carried in the depreciation fund. This fund and the proceeds thereof shall be used for no other purpose than as provided in this section and for depreciation.

The weight to be given to depreciation as an element in determining the valuation of a utility has already been considered in a previous chapter. Since its purpose is to keep the original investment intact, it must also be considered in computing the cost of the service for the purpose of determining rates. Were depreciation not thus allowed capital could not be induced to enter the field, for the investment on which the securities rest would be yearly deteriorating.

Before the era of regulation little attention was paid to depreciation. Instead of setting aside a reserve to take care of it, this amount was included in the net earnings to be divided among the stockholders. What renewals were necessary were generally charged to new construction upon which new capital issues were predicated. This method of watering and rewatering went on until rates became excessive or until it was no longer possible to secure money on new stock issues.[1] The evil of such a system, pointed out in numerous decisions by the Commission, has been expressed thus:

When depreciation is collected from the customers[2] it should be devoted to the upkeep of the plants, and not diverted to the stockholders. This the consumers have a right to demand. To turn over the depreciation so collected to the stockholders is equivalent to paying dividends out of the capital; for such depreciation is the amount that is required in order to keep the

[1] *In re Application La Crosse Gas & Elec. Co.*, 1907, 2 W. R. C. R., 12.

[2] *In re Menominee & Marinette Light & Traction Co.*, 1909, 3 W. R. C. R., 778, 790.

investment intact. Such use of the amounts collected from the consumers for depreciation under the conditions named might even furnish justification for demanding that it either be restored to the depreciation fund, or deducted from the valuations upon which rates are based.

Methods for determining the life of a property are detailed and complex. Some parts of a plant are worn out in five years; other parts in ten, fifteen, twenty or even one hundred years. The parts must be classified on the basis of life and considered in age groups. This life is not the same for all plants even of the same class. Materials from which the plant is constructed, the care of the equipment, method of operation and local conditions, such as the character of the soil through which the pipes of a water utility pass, the kind of water supplied, and electrolysis, all have an effect in determining depreciation.

The engineering staff of the Wisconsin Commission, in determining the life of the various classes of property and the amount of depreciation that has taken place therein, not only carefully examine the property and make full notes on all the facts by which its condition appears to be affected, but they also make use of life tables of various kinds as well as of other facts and information that have any bearing upon the matter [said Commissioner Erickson].[1] Among other things they have prepared tables which show the per cent conditions on the sinking fund basis for various lengths of life as high as one hundred years. This per cent condition, when used, is still further controlled by the condition of the property as ascertained by actual inspection. When this condition is good the property is rated at about one hundred per cent of its unexpired life. When it is poor, it is rated at about eighty per cent of its life, etc. These tables are rather complicated. This is also more or less true of the methods by which they are applied. The results obtained in this way have

[1] Commissioner Erickson, Address at Detroit, Mich., Sept. 25, 1912, *op. cit.*

often been tested by other methods. In fact, it has been determined again and again that such tables, supplemented by close personal inspection of the property, almost invariably lead to more reliable results than would be obtained from inspection alone.

Considering all of the different classes of property, elements and conditions, the engineers compute the life of each of the parts of a plant as well as the "composite life" of the plant as a whole. The latter is the aggregate of the lives of the separate units of equipment, and represents the number of years during which the entire plant will have depreciated to an amount equal to its first cost. In determining the composite life two methods are ordinarily used: (1) "dollar year" method, (2) direct, or "straight line" method.

Under the first method property is all classified as to cost value less scrap, and as to age. A computation is then made (*See* Tables I and III) as to how many times each part will have to be renewed before the part of longest life is renewed. "There is then determined[1] the total number of dollars required for each class during the longest life period and this, in turn, is multiplied by the number of years during which each dollar 'does duty.' The result of this multiplication is a figure representing 'dollar years,' which is divided by the total dollars used for the purpose of replacement during the longest life period, which gives the average or composite life." A comparison of the results obtained under either method shows that they are the same. Each process shows the life of the water company used as an example in the tables to be 61.64 years and of the electric light and power plant to be 17.15 years.

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[1] *City of Ripon* v. *Ripon Lt. & Water Co.*, 1910, 5 W. R. C. R., 1, 20 21.

According to the direct method, the process mostly used by the Railroad Commission of Wisconsin, the life of each unit is determined. It is then assumed that during this life the depreciation is uniform.[1] If a unit expires in five years, one-fifth of its cost (*See* Tables II and IV) is set aside annually. The composite life of the plant is ascertained by dividing the sum for all the classes into the total cost new of all the property less its scrap value. The direct method of determining the composite life of the plant has a very close application to the "straight line" method of financing the depreciation, to be discussed in later paragraphs.

Water Works

TABLE I

"DOLLAR YEAR" METHOD

Class	Life	Cost of reproduction new	Scrap value	Cost new less scrap	Times renewed in 100-year period	Dollars required in 100-year period	Dollar years
A.....	5	$245	0	$245	20.00	$4,900	24,500
B.....	15	2,020	0	2,020	6.67	13,473	202,095
C.....	20	5,950	469	5,481	5.00	27,405	548,100
D.....	25	3,177	922	2,255	4.00	9,020	225,500
E.....	30	23,193	327	22,866	3.33	76,143	2,284,290
F.....	40	19,080	40	19,040	2.50	47,600	1,904,000
G.....	50	59,964	3,016	56,948	2.00	113,896	5,694,800
H.....	100	208,070	22,121	185,949	1.00	185,949	18,594,900
Total...	....	$321,699	$26,895	$294,804	.....	$478,386	29,478,185

Average life $\frac{29,478,185}{478,386} = 61.64$ years.

Several plans have been worked out by engineers for financing the depreciation once the average or composite life has been determined. Of these only two, in general use in the United States, are given cognizance by the Wis-

[1] *Hill et al. v. Antigo Water Co.*, 1909, 3 W. R. C. R., 623, 643.

TABLE II

Direct Method

Class	Life	Cost of reproduction new	Scrap value	Cost new less scrap	Annual per cent of depreciation	Annual am't required to cover depreciation
A.....	5	$245	0	$245	20.00	$49
B.....	15	2,020	0	2,020	6.67	135
C.....	20	5,950	469	5,481	5.00	274
D.....	25	3,177	922	2,255	4.00	90
E.....	30	23,193	327	22,866	3.33	761
F.....	40	19,080	40	19,040	2.50	476
G.....	50	59,964	3,016	56,948	2.00	1,139
H.....	100	208,070	22,121	185,949	1.00	1,859
	.....	$321,699	$26,895	$294,804	.....	$4,783

Average life $\frac{294,804}{4,783} = 61.64$ years.

Electric Lighting and Power Plant

TABLE III

"Dollar Year" Method

Class	Life	Cost of reproduction new	Scrap value	Cost new less scrap	Times renewal in 75-year period	Dollars required in 75-year period	Dollar years
A.....	5	$210	.....	$210	15.00	$3,150	15,750
B.....	8	7,124	$14	7,110	9.38	66,692	533,536
C.....	10	17,361	153	17,208	7.50	129,060	1,290,600
D.....	12	26,272	0	26,272	6.25	164,200	1,970,400
E.....	15	143,470	11,920	131,550	5.00	657,750	9,866,250
F.....	16	65,632	33,375	32,258	4.69	151,290	2,420,640
G.....	20	113,336	9,239	104,097	3.75	390,364	7,807,280
H.....	25	43,747	7,631	36,116	3.00	108,348	2,708,700
I.....	50	14,337	0	14,337	1.50	21,506	1,075,300
J.....	60	1,165	0	1,165	1.25	1,456	87,360
K.....	75	21,920	0	21,920	1.00	21,920	1,644,000
Total...	.....	$454,574	$62,331	$392,243	.....	$1,715,736	29,419,816
		12% over head.....		47,069			
				$439,312			

Average life $\frac{29,419,861}{1,715,736} = 17.15$ years.

TABLE IV

DIRECT METHOD

Class	Life	Cost of reproduction new	Scrap value	Cost new less scrap	Annual per cent of depreciation	Annual am't. required to cover depreciation
A.....	5	$210	$0	$210	20.00	$42
B.....	8	7,124	14	7,110	12.50	889
C.....	10	17,361	153	17,208	10.00	1,721
D.....	12	26,272	0	26,272	8.33	2,188
E.....	15	143,470	11,920	131,550	6.67	8,774
F.....	16	65,632	33,374	32,258	6.25	2,016
G.....	20	113,336	9,239	104,097	5.00	5,205
H.....	25	43,747	7,631	36,116	4.00	1,445
I.....	50	14,337	0	14,337	2.00	287
J.....	60	1,165	0	1,165	1.67	19
K.....	75	21,920	0	21,920	1.33	292
Total.....	.....	$454,574	$62,331	$392,243	.....	$22,878
		12% over	head.....	47,069	.....	2,745
				$439,312	.....	$25,623

Average life $\frac{392,243}{22,878} = 17.15$ years.

consin Commission. They are: (1) Sinking fund, or compound interest curve basis, (2) straight line basis.

Explaining the purposes and differences between these two methods the Commission in the case of the *State Journal Printing Company* v. *Madison Gas & Electric Company*[1] said:

The compound interest curve method of determining the annual amounts required to make up the depreciable plant values assumes that equal annual amounts will be set aside for the separate classes of equipment, arranged according to their length of life, sufficient with the aid of interest accumulations at a given per cent, to make up the depreciable value of the property of that class at the end of its life. The composite life on this basis is the number of years necessary to accumulate the sum total of these separate reserves at the given per cent of interest. The estimated reserve under this method is the minimum allowance re-

[1] *State Journal Printing Co. et al.*, 604-605.

quired to meet depreciation. It assumes that replacements will not occur before the end of the assumed life and that, hence, the reserve will have every opportunity to accumulate the expected interest. . . .

The straight line method of determining the annual amounts required to make up the depreciable plant values assumes that there will be no interest accumulations. The total to be set aside each year in this case is the sum total obtained by dividing the value of each of the separate classes by its life. The composite life is the multiplier required to make these annual payments equal to the entire depreciable plant value. Here, it should be noted, the estimated reserve is the maximum allowance required to offset depreciation. Replacements may be made with any degree of frequency, as the exchange of debits and credits to the reserve account is supposed to be so continuous as to entirely obviate the possibility of interest accumulations.

Perhaps these methods become more intelligible to the average reader when applied to a concrete plant for illustration. The accompanying tables prepared by Commissioner Erickson assume an electric plant whose depreciable property at cost new amounts to $454,574 (Tables III or IV). The scrap value totals $62,331, leaving a balance of $392,243, which represents total depreciation that must be met out of the operating revenues of the plant before its entire life has expired.

As the composite life of this electric plant has already been determined to be 17.15 years, the average amount to be set aside annually under the straight line basis of financing the depreciation is $22,878. These facts set forth in Table IV show that the rate of depreciation varies from 20 per cent for property in the five-year group to 1.33 per cent for property in the seventy-five-year group. For all these groups of tangible property the average rate is 5.33 per cent on the depreciable amount. This method, being the more simple of the two, is advocated by the Railroad

Commission in a majority of cases and is also generally used by the Interstate Commerce Commission.

The difference between the straight line and the sinking fund method is that the latter assumes that the amounts annually set aside shall bear compound interest. These interest payments added to the fund obviously require a smaller annual allowance out of the operating revenues. While in some instances only a 2-per-cent interest is allowed on the fund, the predominating sentiment favors a 4-per-cent basis, the rate of interest paid by banks. The latter rate is used in Table V as an illustration.

TABLE V

SINKING FUND METHOD (4 Per Cent)

Class	Life	Cost of reproduction new	Scrap value	Cost new less scrap	Annual per cent reserved on 4-per-cent basis	Annual fund
A.....	5	$210	$0	$210	18.46	$39
B.....	8	7,124	14	7,110	10.85	771
C.....	10	17,361	153	17,208	8.33	1,433
D.....	12	26,272	0	26,272	6.65	1,747
E.....	15	143,470	11,920	131,550	4.99	6,564
F.....	16	65,632	33,374	32,258	4.58	1,478
G.....	20	113,336	9,239	104,097	3.36	3,498
H.....	25	43,747	7,631	36,116	2.40	867
I.....	50	14,337	0	14,337	.65	93
J.....	60	1,165	0	1,165	.42	5
K.....	75	21,920	0	21,920	.22	48
Total.....	.....	$454,574	$62,331	$392,243	.....	$16,543
		12% over head.....		47,069	.....	1,985
				$439,312	.....	$18,528

Average life $\frac{16,543}{392,243} = .04217 = 17.01$ years.

Applying these principles to the same electric plant described above, the amount set aside and charged to operating expenses is $16,543, or about 4.20 per cent of the property. With a compound interest rate of 4 per cent the

allowances increase from $16,543 the first year [1] to $23,545 for the tenth and to $30,985 for the seventeenth. Under this plan the amount of estimated depreciation is lowest at first and gradually increases, as interest payments on the growing fund increases. In favor of the adoption of the sinking fund basis, it is pointed out that usually a utility becomes better established year after year; that its earnings increase correspondingly and that the depreciа-

TABLE VI

COMPARISON OF ANNUAL RESERVES SET ASIDE TO COVER DEPRECIATION UNDER STRAIGHT LINE AND SINKING FUND METHODS

Year	Straight line	2 per cent sinking fund	4 per cent sinking fund
1	$22,878	$19,454	$16,543
2	22,878	19,843	17,205
3	22,878	20,240	17,893
4	22,878	20,645	18,609
5	22,878	21,057	19,352
6	22,878	21,479	20,126
7	22,878	21,909	20,932
8	22,878	22,347	21,769
9	22,878	22,794	22,641
10	22,878	23,249	23,545
11	22,878	23,712	24,487
12	22,878	24,189	25,468
13	22,878	24,672	26,485
14	22,878	25,166	27,546
15	22,878	25,670	28,647
16	22,878	26,183	29,792
17	22,878	26,707	30,985
17.15	3,431	3,112*	165†
Total	$392,357	$392,428	$392,190

*.16 year.
†.01 year.

[1] For more detailed depreciation tables, *see* Erickson's address, Sept. 25, 1912, *op. cit.*

tion is greater as the years go by than at first when the plant is new. As an economic principle it would follow that such a basis of financing the depreciation would be sound. Since the interest payments are added to the fund the direct charges to operating expenses are lower, which of course is reflected in the rates. Wherever convenient this method is applied by the Wisconsin Commission, though not in as many instances as the straight line plan.

Preceding is a comparison of the annual reserves set aside to cover depreciation under the straight line and sinking fund methods as applied to the electric plant described above.

Circumstances, however, determine which method shall be applied by the Railroad Commission. The law does not require that this money for depreciation shall be kept on hand, nor that it must be invested outside of the utility. Instead, the statute permits the use of the funds "in new construction, extensions or additions to the property of such public utility, or invested; and if invested the income from the investment shall also be carried in the depreciation fund." The money in the depreciation fund cannot be diverted to another purpose, but only temporarily loaned to meet the demands of actual conditions. It must be restored to the fund when needed to cover the demands of depreciation. The capital for the new extensions must ultimately be obtained by some financial method similar to that used to raise money for new extensions, had the depreciation fund not been in existence.

Tables have also been prepared to illustrate the life of several classes of utilities in Wisconsin and the rate of depreciation. These two tables have been made up from the data collected on twenty-three Wisconsin water companies and twenty-three electric plants. They show present value, composite life of the depreciable property, and the annual rate of depreciation. Here again the longevity

of water plants (37 to 62 years) compared with electric plants (14.6 to 20.8 years) is clearly illustrated. This difference in life is reflected in the rates for depreciation which vary from 1.24 to 2.44 per cent in water plants compared with 2.35 to 6.20 per cent in electric concerns.

Wisconsin Water Utilities

TABLE VII

DEPRECIATION RESERVES

Utility	Population of city (1910 census)	Cost of reproduction new	Per cent condition	Present value	Composite life (straight line) years	Composite life (4 per cent sinking fund) years	Annual fund (straight line)	Per cent of fund total property, including land
A.....	40,884	$860,001	94.6	$653,070	67.29	58.00	$8,548	1.24
B.....	25,531	531,020	93.4	496,346	49.86	44.34	8,212	1.55
C.....	11,894	401,681	94.0	377,517	63.11	56.25	5,642	1.41
D.....	16,773	268,687	84.6	287,445	51.96	47.68	4,458	1.66
E.....	14,610	318,427	91.5	291,022	61.62	56.95	4,784	1.50
F.....	8,893	185,148	92.3	170,824	67.60	59.60	2,464	1.33
G.....	8,092	127,897	88.4	113,060	48.11	55.74	2,325	1.82
H.....	5,629	109,432	94.7	100,502	60.55	53.30	.....	.....
I.....	3,793	101,360	93.1	94,319	44.76	44.16	1,145	1.13
J.....	7,196	84,276	90.2	77,201	60.03	55.57	1,076	1.28
K.....	5,036	73,493	90.1	66,216	56.99	50.65	1,163	1.58
L.....	3,830	61,139	92.0	56,285	66.33	58.38	812	1.33
M.....	2,675	36,947	92.2	34,072	55.51	51.07	577	1.56
N.....	2,907	36,899	90.1	33,225	59.31	51.75	518	1.40
O.....	2,582	49,855	92.9	46,315	54.66	48.69	748	1.50
P.....	1,808	23,138	89.9	20,804	69.77	62.04	286	1.24
Q.....	1,833	11,784	79.6	9,937	36.49	37.00	288	2.44
R.....	804	8,115	90.6	7,334	46.40	45.75	162	2.00
S.....	15 125	242,327	92.0	224,483	62.90	58.12	2,901	1.20
T.....	13,027	220,382	92.9	204,716	66.19	58.51	2,472	1.12
U.....	13,894	217,611	93.1	202,579	63.69	56.21	2,784	1.28
V.....	18,797	303,449	90.2	279,312	53.49	46.93	8,088	2 61
W.....	6,324	120,816	91.7	110,426	56.16	49.33	1,839	1.52
Arithmetical average	10,076	$183,899	91.0	$169,435	57.55	52.43	$2,786	1.53

The subject of depreciation raises many engineering and economic problems that are only suggested in this chapter and illustrated by the accompanying tables. No

Wisconsin Electric Utilities

TABLE VIII

DEPRECIATION RESERVES

Utility	Population of city (1910 census)	Cost of reproduction new	Per cent condition	Present value	Composite life (straight line) years	Annual fund (straight line)	Per cent of fund to total property, including land
A	40,384	$342,624	74.1	$253,766	17.91	$16,310	4.76
B	30,417	478,501	79.4	379,825	17.15	22,876	4.78
C	18,797	154,023	77.4	119,186	15.55	8,883	5.76
D	15,125	178,610	83.7	149,581	18.18	9,313	5.21
E	8,893	75,773	65.3	49,484	15.60	4,650	6.14
F	5,783	47,230	80.9	38,193	15.49	2,611	5.53
G	4,717	51,480*	74.6	38,436*	19.45	2,119	4.12
H	4,477	56,492*	77.2	43,593*	16.97	2,896	5.13
I	3,224	37,583*	75.7	28,440*	17.31	1,945	5.17
J	2,692	27,418	63.4	17,389	16.75	1,478	5.39
K	2,652	35,752	81.5	29,152	16.02	1,928	5.39
L	2,582	41,511	80.5	33,415	19.29	1,712	4.12
M	2,450	26,142	62.0	16,223	14.69	1,509	5.77
N	1,860	25,660	70.8	18,171	15.71	1,191	4.64
O	1,833	21,180	80.3	17,015	22.38	779	3.68
P	1,803	19,524*	76.8	14,985*	20.80	1,210	6.20
Q	919	11,865	97.4	11,557	15.09	687	5.79
R	425	17,559	85.0	14,917	18.25	647	3.68
S	25,531	443,158	78.9	349,846	17.02	24,694	5.57
T	25,236	119,505	79.9	95,490	16.73	5,846	4.89
U	11,594	80,079	71.8	57,501	16.03	1,884	2.35
V*	5,036	93,139	70.4	65,567	17.54	3,874	4.16
W	3,739	35,804	75.1	26,899	18.24	1,861	5.20
Arithmetical average	9,573	$105,244	76.6	$81,245	17.31	$5,257	4.93

* Does not include land.

attempt is made to cover the entire field—that would require a volume in itself. But enough has been said to outline the reasons for its allowance, the systems by which it is computed, and the method followed by the Railroad Commission of Wisconsin in recognizing it.

Accountants differ as to the manner of recording depreciation transactions upon the books of a company. The Wisconsin Commission provides, in its system of uniform

accounts, that a "Depreciation Account" shall be opened as a part of the operating expense "to which shall be charged monthly, crediting the depreciation reserve, an amount equal to one-twelfth of the estimated annual depreciation of the tangible capital in the service of the utility." When property has to be renewed the cost new of the same, less scrap value, is charged to the depreciation reserve and credited to the cash account. The necessary adjustments are also made in the entries to the property accounts.

CHAPTER VIII

PUTTING UTILITIES ON A BUSINESS BASIS

The usual concept of regulation is that it is a means of protecting the interests of the public in the matter of lower rates and better service. But regulation would be far from effective if this were its only purpose. Utilities would only have to obey the mandates of the Commission and do nothing more.

A situation such as this would lead to a condition of staticism in all public utility lines. For this reason, regulation must be twofold. It must have in mind not only the interest of the public but also the interest of the public service corporation. In formulating rate orders and imposing service requirements, the Commission must have in mind at all times that its final action must be based upon two considerations, namely, how the interest of the public may be conserved and how the progress of the industry may best be promoted.

Demagogues on the subject of regulation lose sight of this latter consideration entirely and in their desire to obtain lower rates or better service from existing equipment they often neglect to consider the effect that such action may have upon the policy of the management of public utilities and also upon the ease with which capital may be induced to flow into the field. Not only must capital be brought into the public utility field but the interest of the investor must be directed to his investment to such an extent that new and modern methods are in-

troduced whenever they are placed upon the market. Experimentation must be encouraged and every effort must be directed toward the promotion of increased efficiency.

The Railroad Commission has often been criticized for its recognition of efficiency in management when rate adjustments are made. But its critics do not view in its proper light the scope of regulation. If the Commission were to reduce the rates of an efficient plant as soon as any savings were effected, the incentive to be efficient would be entirely eliminated and as a result no progress would be made in extending the public utility business. In order to judge fairly the efficiency of plants, data must be at hand which will clearly show the comparative performance of the various factors in the production, transmission or delivery of light, heat, water, or gas, as the case may be. The methods by which the efficiency of public utilities are tested will presently be discussed.

UNIFORM ACCOUNTING

All efficiency is relative. This necessitates a common basis for comparison. The Railroad Commission recognized this fact early in its history. A uniform system of accounts was adopted which permitted a comparison of utilities operating under similar conditions and circumstances. Utilities, under this system, are classified according to the population of the locality in which they operate and according to the revenue derived from that locality.

Having thus established a basis of comparison, it is an easy task for the Commission to compare the relative efficiency of the various plants operating under similar circumstances. Every year the Commission publishes a unit cost analysis which shows the cost per unit of the different factors of production.

That such data make for progress in the public utility

field is evidenced by the fact that public utility operators are constantly reviewing both the Commission's annual report and the reports of individual utilities.

Every effort is made to effect economies. Electric utility operators compare their fuel costs, steam costs, power costs, distribution costs, etc. During a period of three years, fuel efficiency alone in steam plants has tremendously increased, so much so that large plants have, in some instances, been able to successfully compete with water power. Below is given a comparative table showing the cost per unit for 1910 and 1913 of several items included in the cost of power.

	Cost per kilowatt hour (in cents)	
	1910	1913
Fuel expense	.67	.58
Steam expense	.81	.71
Total power expense	.73	.51

It will be noted that the elements of power cost per unit have been reduced in some instances as much as 25 per cent despite the fact that fuel and labor costs are steadily advancing. This fact alone shows that the Commission's regulation of utilities has not been a detriment to the promotion of efficiency, but rather an aid.

Efficiency engineers have learned early in their work that cost analyses must be made on some comparable bases before efficiency in operation can be accomplished. The Railroad Commission adopted this principle when it took up rate investigations from the cost point of view. With the information which it had at hand it investigated the comparative cost of pumping by steam and electric power,

of generating by steam or hydraulic power, of purchasing current or generating by local plant equipment. This information is furnished to utilities upon request.

Municipal water plants have been advised as to the saving to be effected by the operation of their plants by other than present means of pumping. Electric companies have been able to determine whether it would be to their advantage to buy or generate current.

As a consequence of the Commission's activity in demonstrating the desirability of large-scale production many local plants have either been dismantled or made to serve as substations and auxiliary stations. Not only does this account for a lower cost of production in these plants, but in addition it permits small communities through which transmission lines pass to receive service at reasonable rates, whereas under the old system of each locality with its private plant such small communities could not be served at all or at most at a prohibitive price.

The Commission even before the stock and bond law was passed had directed the attention of utility management from the promotion side to the operating side of the business. In several of the larger cities the inefficient features of operation have been pointed out. In some cases this has been done in the written decisions while in others it has been taken up informally with the companies themselves.

The larger utilities were the first to look to the fund of information which the Commission had available in its search of the cost of taking on additional business. In the electric business, many utilities in localities where water power was near by were at a loss whether to continue steam plant operation or to buy water power. With the Commission's uniform classification of accounts and the inventories of property values at hand the matter was greatly simplified.

Purchase of properties has been greatly facilitated as each of the parties interested in the transfer has access to the other's report and the system of accounting being the same it has been an easy matter to arrive at a mutual understanding. Investment companies, stockholders, and bondholders have been able to ascertain the conditions surrounding their investments.

INCREASE IN SURPLUS ACCOUNTS

One of the best evidences of conservative and businesslike management is the increase of the surplus account. Utilities formerly disposed of most of their surplus earnings in dividends instead of retaining such excess in their business. As a consequence, during periods of low earnings such utilities either did not pay their customary dividends or, if they did pay them, decreased their surplus materially, thus impairing their credit. Regulation has remedied this former unbusinesslike practice.

In Wisconsin the increase of the surplus of utilities has not only been actual but relative. The following tabulation will show the extent of the increase in the surplus account.

It will be noted that the total surplus for all utilities operating in the state has borne about the same relation to gross earnings since 1910. The remarkable fact in connection with the table is, however, the relation of the total surplus account to the plant value. In this respect it will be seen that the surplus account has been steadily increasing. No conclusion can be drawn other than that the utilities are setting aside a rather fixed percentage of their gross earnings as surplus and that the total surplus account is growing rapidly, due largely to the fact that gross earnings are increasing more rapidly than plant

TABLE I

GROWTH OF THE SURPLUS ACCOUNT OF UTILITIES IN WISCONSIN, BY PERCENTAGES

Utilities	1913		1912		1911		1910	
	Relation of surplus for year to gross earnings	Relation of total surplus to plant value	Relation of surplus for year to gross earnings	Relation of total surplus to plant value	Relation of surplus for year to gross earnings	Relation of total surplus to plant value	Relation of surplus for year to gross earnings	Relation of total surplus to plant value
Electric railways	2.05*	7.10	.42*	7.43	.54	6.60	.02	3.31
Electric utilities	12.76	13.32	10.09	7.55	8.57	6.50	12.61	6.55
Gas utilities	7.65	4.33	5.40	4.78	8.19	3.80	1.20	3.41
Water utilities	19.76	52.20†	8.54	47.90†	24.67	45.80†	26.98	42.90†
Telephone utilities	6.21	8.29	4.51	8.42	4.73	8.08	5.88	7.63
Heating utilities	4.34*	.91*	5.18	.03*	3.08	1.98*	6.68	1.40*
Average for all utilities	6.32	12.99	4.96	12.80	6.91	11.91	6.68	10.58

* Deficit.
† Includes city equity.

values. This point can be more clearly illustrated by the following table:

TABLE II

PERCENTAGE INCREASES IN CONSTRUCTION EXPENDITURES AND OPERATING REVENUES FOR YEAR 1913, USING YEARS 1910, 1911 AND 1912 AS BASES

Classification	Plant cost increases year 1913			Operating revenue increases year 1913		
	Over 1910	Over 1911	Over 1912	Over 1910	Over 1911	Over 1912
Electric utilities....	17.98	1.13*	8.75*	62.04	27.92	17.58
Gas utilities.....	6.20	4.27	8.99	18.61	13.73	8.99
Water utilities.....	14.17	9.57	6.38	25.38	13.40	1.20
Telephone utilities..	18.12	13.71	5.16	31.56	20.18	9.53
Heating utilities....	55.23	25.51	19.58	65.47	64.41	22.86
Electric railway utilities.....	26.09	13.92	6.45	16.75	8.86	6.45

* Decrease.

It will be noted from a study of the table that although the plant value of utilities in Wisconsin has steadily increased, it has not kept pace with the increase in the total revenues of the utilities. It should be mentioned that the percentage decreases in plant value of electric utilities during the years 1911 and 1912 are due to the fact that during 1913 the dam of one of the largest water-power companies went out, thus destroying some four million dollars of property value. Aside from this instance, however, there has been a remarkable increase in plant values, thus showing that the investors are not withholding capital as now protected by the stock and bond statutes.

The question immediately arises as to how this increase in revenues is disposed of. In Table I it was shown that only about the same percentage of total revenue was placed

TABLE III

GROWTH OF DIVIDEND ACCOUNT OF UTILITIES IN WISCONSIN, BY PERCENTAGES

Utilities	1913		1912		1911		1910	
	Relation of dividends for year to gross earnings	Relation of dividends to capital stock	Relation of dividends for year to gross earnings	Relation of dividends to capital stock	Relation of dividends for year to gross earnings	Relation of dividends to capital stock	Relation of dividends for year to gross earnings	Relation of dividends to capital stock
Electric railways	18.80	5.50	19.63	5.75	21.39	5.75	18.20	5.16
Electric utilities	9.06	3.80*	9.53	2.74	9.54	2.66	5.76	1.51
Gas utilities	10.95	5.22	12.39	5.42	11.40	4.62	17.69	7.12
Water utilities	3.93	2.91	2.53	1.79	2.63	1.48	2.77	1.16
Telephone utilities	16.22	6.69	17.43	6.44	19.02	6.54	16.61	5.23
Heating utilities	17.68	3.64	10.29	3.42	13.72	3.59	13.48	4.30
Average for all utilities	13.09	4.82*	13.74	4.42	14.55	4.42	13.68	4.10

* $5,000,000 of capital stock included in each of previous years was not included in 1913 because company issuing same went into hands of a receiver. Dividend would actually be only 4.54 per cent., as this company never declared any dividends.

to the credit of the surplus account each year. The natural conclusion would be that utilities were increasing their dividends to stockholders. For this reason, the preceding table is instructive.

This table shows that not only are the dividends decreasing in comparison with gross earnings, when one might expect the opposite to be true, but the actual declaration of dividends has been confined to about the same amount each year. It will be noted that the average dividend on capital stock for all Wisconsin utilities is in the neighborhood of four and one-half per cent per annum. Even taking into consideration the probable overcapitalization of some of the utilities there is still an ample margin before an unreasonable dividend rate is reached. The telephone utilities probably fairly illustrate the rate of return that all utilities in general would receive upon a fair value of their property. This is the case because the Commission has found that the value of telephone property as reflected upon the books of the companies is in most instances very near to the fair value of the plant and business upon which the company is allowed to earn a return. In addition to this fact, telephone utilities usually do not issue bonds, so that their dividends for all practical purposes represent the total disbursements made from their net income. In accordance with the above discussion on the dividends paid by public utilities in the state, it is evident that disbursements made for this purpose are not in proportion to the increase in earnings but quite the opposite.

The Commission has given attention to the matter of depreciation. Probably on no other point has the Railroad Commission of Wisconsin more consistently dwelt than on the subject of the depreciation of utility equipment. Utility managers have been cautioned to provide adequately for the wear and tear, obsolescence and inadequacies of their plants. As a result, more and more of the operating earn-

ings have been set aside for this purpose. The following table shows the amount of depreciation set aside in the case of each of the various utilities. The table also shows the relative increase of this allowance.

TABLE IV

SHOWING THE ACTUAL AND RELATIVE INCREASES IN THE ANNUAL ALLOWANCES FOR DEPRECIATION BY WISCONSIN UTILITIES

	1913	1912	1911	1910
Electric utilities...	$595,694.57	$568,183.33	$421,520.14	$373,725.92
Gas utilities.....	284,910.66	247,757.89	254,159.21	253,632.58
Water utilities....	184,006.46	136,663.89	69,917.58	31,839.31
Telephone utilities	1,083,863.38	940,183.00	971,850.08	920,362.60
Heating utilities...	15,459.65	12,350.08	9,790.98	9,383.83
Total.....	2,163,934.72	1,905,138.19	1,727,237.99	1,588,944.24
Per cent of Plant Value.....	1.93	1.73	1.63	1.65
Per cent of Total Revenue.....	10.02	10.30	10.15	10.55

It is obvious from a study of this table that the allowance for depreciation has kept pace with the increased operating revenues and that relative to plant value on which depreciation is based it has steadily increased.

By constant attention to the matter utility operators in Wisconsin are now providing for renewals from their depreciation reserve instead of adding such replacements to the property and plant account (already heavily watered in some cases) or to the operating expenses for the year.

The foregoing analysis of the financial situation leads to the conclusion that operating revenues and plant values of utilities in Wisconsin have been steadily increasing. The depreciation and surplus accounts of the utilities have increased at about the same rate as the earnings while the

dividends declared as compared with earnings have slightly but steadily declined. Production costs in the case of electric utilities have to a considerable extent been reduced. There remains to be explained what has become of the difference between the steadily increasing operating revenues and the items which we have already shown to have either remained relatively stationary or to have decreased in comparison with total revenues. The following table completes the story:

TABLE V

RELATION OF OPERATING EXPENSES, INCLUDING DEPRECIATION AND TAXES, TO TOTAL REVENUES—WISCONSIN UTILITIES

Classification	1913	1912	1911	1910
	Per cent	Per cent	Per cent	Per cent
Electric railways..	70.64	68.38	67.96	68.94
Electric utilities...	66.07	69.59	66.26	65.65
Gas utilities.....	69.28	68.98	66.57	67.01
Water utilities....	52.60	48.94	50.06	48.27
Telephone utilities.	77.12	77.58	76.15	77.26
Heating utilities...	86.97	85.82	83.45	79.86
Total.....	68.90	68.55	67.15	67.55

It will be noted that in the case of the electric railway, gas, water and heating utilities, the operating ratio has steadily increased; in the telephone industry it has remained about stationary; and in the electric utility the relation varies upward and downward. When the total for the entire state is given consideration, there is seen to be a rather steady increase in the ratio of operating expenses to total revenues. This relative increase in the operating expense explains where the increased earnings have been put.

There are several reasons why this operating ratio has increased. No doubt the first one called to mind is that of

the increased cost of labor and material. In the ordinary manufacturing business such increases of cost are generally met by higher prices to the consumer, so that the ratio of operating expenses to total revenues always remains about the same.

It will be noted, however, in a review of the cases which the Commission has decided, that it has ordered reduction of rates in most cases in the very utilities which are affected by this increased operating ratio. All of the substantial rate decreases have been in the case of electric railway, electric, gas, and water utilities. Increases have been allowed to some extent in the case of the rates of telephone companies, while no heating case involving rate adjustments has as yet been decided by the Commission. The decrease in the margin between operating revenues and operating expenses can then be traced to the very door of regulation.

The explanation of how such lowering of the rates is possible in the face of increased expense leads one back to the point where this discussion began. By efficient methods of production and by constant increases in sales, the output of these public utilities has increased tremendously. In some measure this increased consumption of utility products has been due to the constant effort directed toward increased consumption by existing consumers and to some extent to the rapid rate at which new customers have been added.

As has been previously shown, the cost per unit has steadily decreased. In the electric utility, this is due to the consolidation of plants, thus effecting a saving in cost which can hardly be realized by one who has not watched the growth of these utilities. In the gas business, decreased cost has come about by increasing the sales in proportion to the investment. The same is true in the water business. In the electric railway business, the traffic

density has increased in all of our cities and travel has been heavier. In all of these cases the number of units of product sold has increased faster than the increased expenses due to the upward tendency in the cost of wages and materials.

It is probably now apparent what the duties of the Commission are in respect to this situation. In the electric utility, the state regulatory body must not only encourage consolidation, but it must also help utilities in increasing sales to existing customers, for in its doing so rests the only hope of reduced prices to the consumer. The same is true of electric transportation. Extensions of lines cannot be ordered at will for the increased cost occasioned by these added investments might dissipate all of the surplus earnings brought about by the increase in the number of passengers carried. The same is true in the other lines mentioned. Due to the peculiarities of the customary telephone rate schedules, the telephone companies are required to keep their operating ratio about constant or only slightly increasing in order to earn a fair return on the investment.

Nothing is more certain than that a vigilant commission must keep these various factors in mind when regulating public utilities. Efficiency must be promoted in order that rates shall continue to be lowered instead of increased.

CHAPTER IX

MAKING OF RAILROAD RATES

The revenues of a railroad company are derived principally from two sources—passenger and freight traffic. Between 26 and 30 per cent of the earnings of Wisconsin railroads are derived from passenger service; approximately 70 per cent comes from the freight service.

The gross earnings from passenger-train traffic consist of amounts received for transporting passengers and their baggage, carrying mail, milk and express, and other miscellaneous transportation services. The gross earnings from the freight-train traffic are composed primarily of the receipts for transporting freight and for the switching of carload freight traffic. In addition, railroads derive earnings from certain terminal operations, not involving a transportation service, however. The most important of these sources are: storage of freight and baggage; station and train privileges; operating elevators and stockyards; telegraph and telephone services; conducting hotels and restaurants.[1]

At first the Wisconsin Commission had direct charge over passenger fares and one of its early orders[2] was a reduction of the three-cent passenger rate. The legislature of 1907, however, passed a mandatory law[3] fixing a

[1] *In re Passenger Rates M. St. P. & S. S. M. Ry. Co.*, 1907, 1 W. R. C. R., 544.

[2] *Buell, etc., op. cit.*, 324.

[3] Sec. 1798a (Ch. 654, Laws of 1907) Wis. Stat., 1913.

flat two-cent passenger rate per mile on all railroads having gross earnings in excess of $3,500 a mile per annum. Most of the roads of the state earning less than this minimum immediately announced two-cent fares for competitive reasons, with the result that over 98 per cent of the passenger traffic of the state is now handled on the two-cent basis. This law does not affect the other elements of passenger-train traffic, which are still under Commission control.

Power to decide the "reasonableness" of freight rates is given to the Railroad Commission. The law prohibits rebates and discriminations in rates to shippers and requires the approval of the Commission of all changes in existing tariffs, before they become effective. Before the period of regulation, rebating and secret freight rates aided in the building-up of many a monopoly and crushed the life of many a competitor in business. To-day when every shipper in Wisconsin stands on an equal footing it is difficult to realize the demoralized freight-rate conditions existing prior to 1905.

"Much of what the railroads lost in the reduction of open rates that everybody shares, they recovered by being compelled to abolish free passes and secret cut rates that went only to insiders and grafters,"[1] wrote Senator La Follette in 1912 in commenting on the accomplishments of the railroad law after seven years of trial. "The special examiners whom I appointed in 1903 uncovered $5,992,-731.58 as Wisconsin's share of rebates paid by twelve roads during the six years, 1898 to 1903. By stopping rebates alone the railroads have gained at least $1,000,000 a year toward offsetting $2,000,000 they lost by reduction of rates."

That shippers and travelers may now be advised of the lawful rates and charges a railroad may collect for transportation service, the statute requires that two copies of all

[1] La Follette's Autobiography, 354.

tariffs must be published and kept on file at every shipping station and with the Railroad Commission. "The railroad company could not depart from the published rates without incurring a penalty; nor could the petitioner receive the benefit of a lower rate with impunity."[1] Nor will mistakes in quoting the correct rate relieve the shipper from paying the lawful charge, or the railroad from exacting it.[2] Overcharges by the railroad may be recovered by the shipper through the filing of "reparation" proceedings with the Commission. Thus by law is the rebate subterfuge to favorites eliminated. The small shipper is given the same reasonable rate as the large one.[3]

The usual classes of freight rates in force in other states are permissible under the Wisconsin law with the possible difference that "all such rates shall be open to all shippers for a like kind of traffic under similar circumstances and conditions and shall be subject to the provisions . . . as to printing and filing of the same." The Commission is empowered to change any rate or classification; it may order joint rates and is specifically directed to permit concentration, commodity and other special contract rates.

Before considering how the Commission determines the "reasonableness" of a freight schedule or makes a new rate, a definition of each separate class of rates and a statement of the reason for their existence, as viewed in the light of the Commission's decision, should be given, because they are necessary to an understanding of the freight-rate problem. The more important kinds of rates are:

1. Class rates. The charges on the majority of railroad shipments are determined by two factors—first, the

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[1] *Fountain-Campbell Lumber Co.* v. *C. St. P. M. & O. R. Co.*, 1908, 3 W. R. C. R., 64, 999.

[2] *Barney* v. *G. B. & W. R. Co. et al.*, 1910, 4 W. R. C. R., 777, 905.

[3] *In re Rates on Milk and Cream*, 1908, 2 W. R. C. R., 475.

class within which the article is placed, and second, by the rates applicable to that class. There are two separate documents: the classification book and the tariff. "Class rates are usually the highest rates in effect. They are so high in fact that the heavier and cheaper commodities can seldom be moved thereunder and this is very largely the reason why commodity rates have been put into effect."[1]

2. Commodity rates. "Low-grade commodities, generally speaking, must be transported at the lowest reasonable rates, if they are to be moved at all. For such commodities the class rates may easily be so high as to make the cost of transportation exceed the cost of production. These are factors that should always receive due consideration in rate-making, for it is usually to the best interests of all concerned that products of nearly all kinds should be moved from places where they are not needed to places where there is a demand for them."[2]

3. Concentration rates. "A concentration rate is only another name for a transit rate or transit privilege. It is a rate that is sometimes granted on certain commodities when they are reshipped out from the centralizing point to the markets over the same line as that over which they are shipped into the centralizing point, and when the rates out from the centralizing point are high enough to cover any deficit that may arise because of the lower rate into the centralizing point."[3] "A concentration rate is not independent in itself. It is merely a rate that is granted to some points where the commodities may be stopped while in transit for sorting, cleaning, remanufacture, and then be reshipped to their destination over the same line of road."[4]

[1] *Fergot* v. *C. & N. W. R. Co.*, 1909, 4 W. R. C. R., 254.

[2] *Schwoegler & Kelly* v. *C. M. & St. P. R. Co.*, 1910, 5 W. R. C. R., 289.

[3] *Cochrane Co.* v. *C. M. & St. P. R. Co.*, 1908, 3 W. R. C. R., 3-4.

[4] *Webb Produce Co.* v. *C. & N. W. R. Co.*, 1908, 3 W. R. C. R., 35.

4. Local rates. "One of the attributes of a local rate is that it is independent of itself; that it normally constitutes a reasonable compensation for the services covered by it; and that it has no connection with any other local rate or service."[1]

5. Joint or through rates. "The fixing of joint rates between two or more lines for through hauls from points on one line to points on some other line is always a mooted question. Generally speaking, it may be said, however, that the basis for joint rates should be the same as that for local rates. That is, they should as far as possible be based on the cost of the service properly modified, when necessary, by competitive and commercial conditions. Joint rates are ordinarily fixed at a lower figure than the sum of the local rates on each line and at a higher figure than the local rate on one line for a like distance."[2]

6. Group rates. "Group rates are sometimes established between one shipping point and several consuming points, and at other times, again, between one consuming point and several shipping points."[3] "Several sections in the same territory are placed in the same group and . . . some fixed commodity or group is given the same rate to any given market or markets. This method of adjusting the rates, while not scientific, is sometimes justifiable, especially when dealing with established conditions."[4]

Two basic principles in the making of "reasonable" rates may be typified by phrases denoting the doctrines involved: (1) "value of the service" and "what the traffic can bear," (2) "cost of the service."

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[1] *Cochrane Co., op. cit.*, 30.

[2] *Kingle et al.* v. *C. M. & St. P. R. Co. et al.*, 1911, 7 W. R. C. R., 182-183.

[3] *Wisconsin Pulp & Paper Mfrs.* v. *C. & N. W. R. Co., et al.*, 1910, 6 W. R. C. R., 452-453.

[4] *Konrad Schreier Co.* v. *C. M. & St. P. R. Co. et al.*, 1910, 5 W. R. C. R., 672, 849.

The value of the service basis "points out the bounds of extortion." It is based upon the ability to pay. This principle is generally advanced by those who desire freedom in rate-making and who abhor interference and restrictions.[1] It results in separate rates or group rates, disregards distance tariff methods and the relationship of commodities, and is noted for the wide latitude of judgment that may be exercised by the rate-maker. Few writers agree on the exact definition of the phrase, "value of the service." Some contend that value of the service depends upon time and speed of shipment, the equipment of the road and other conditions. Others again hold that "in an exact sense it expresses the value created by the transportation service."[2] By the phrase "charging what the traffic will bear" is meant fixing rates on what the shipper can afford to pay. It is heralded as a "business developer." It is so flexible a method that it has been characterized a "mere haphazard estimate." Judge Noyes frankly says:

> In so far as it empowers railroad officials to fix rates[3] according to their own judgment without other rule or practice than a desire to obtain for their companies all of the revenues possible, present and prospective, it does confer a tremendous power. It is a power, however, subject to the economic check that charging what the traffic will not bear cuts off business and affects the prosperity of the railroad.

The practice of basing rates on the "value of the service" and "what the traffic will bear" factors was begun with the earliest railroads and has been generally followed since. Enough has perhaps been said in explanation to place these principles in contrast with the so-called "cost of

[1] Commissioner Erickson, Address before the National Association of Railway Commissioners, Washington, D. C., 1910, 24.

[2] Walter C. Noyes, American Railroad Rates, 29 n.

[3] *Ibid.*, 55.

the service"[1] basis adopted in Wisconsin. The latter system is now being accepted by the Interstate Commerce Commission,[2] and, in a modified form, by several states. Railroad managers generally believe that this system is fallacious. But the belief that the "value of the service" and "what the traffic will bear" theory is wrong is held by many economists, including Commissioner Erickson, who summarizes his disapproval thus:

> Efforts to extract from these phrases anything that will enable the rate-maker to tell just where he stands at any point in his work are proving fruitless. They appear to be clung to chiefly as the means to get away from the "cost of the service" basis which is less amenable to manipulation for special purposes. They are admirably adapted as a cover for certain past practices, for under them almost all sorts of rates and special preferences in rates can be justified. As they cannot be formulated into a standard, they usually lead to the comparative method in actual practice.[3]

Objection is made to the "cost of the service" basis that the method is too involved; that the fixed expenses cannot be prorated with accuracy over the units, and that the results at best would be but an estimate. Against these protests the Commission in several decisions discusses the efficacy of the cost system compared with any other known or tried method. Its reasons are thus set forth:

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[1] "Commissioner Erickson is probably the leading exponent in the United States of the theory that rates should be based on the cost of the service, including interest on the value of the plant. He has prepared detailed tables showing how the cost of the service of each unit is secured."—Max Thelan, Report on Leading Railroad and Public Service Commissions, Calif., 1911, 48.

[2] M. B. Hammond, Railway Rate Theories of the Interstate Commerce Commission, 68.

[3] Erickson, Address before the National Association of Railway Commissioners, 1910, 24.

We have made careful analyses of the cost of terminal [1] service and of the cost of operation in different branches of the railway service of the respondent companies. While such statistics of average costs as well as their distribution among different classes of freight and commodities are not a matter of exact mathematical adjustment, nor do we believe that they well can be made such, we are nevertheless convinced that such statistics are the only guide that can be provided with reference to the absolute reasonableness of a particular rate and the profitableness or unprofitableness of the same. To deny this is to admit that no measure of any kind whatsoever can be adopted for the determination of the remunerativeness or lack of remunerativeness of a particular rate, and to assign rate-making and every intelligent judgment regarding a rate to the wide and wild domain of conjecture. This may be generally true to-day; we fear it is more widely true than rate-makers would like to admit. On the one hand the income account of the railway companies; on the other hand, considerations of distance, value, space, rate, competition, clamor, importunity, petition, demonstration, threat, reprisal, revenge, good will, favoritism, chance, tradition, speculation, metaphysical generalities and vague notions of all kinds and degrees of consciousness, . . . these appear to be the only admitted guides and rules for the rate-maker. This Commission has been unable to find secure anchorage in any one or more or all of these. We find it absolutely necessary to fall back upon detailed analyses of earnings and expenses and interpret these in the light of as many of the above factors in rate-making as we can reduce to a tangible basis. In saying this we do by no means wish to be understood as maintaining that the cost of the service principle is the only principle of rate-making. Every student of transportation, as well as every practical railway man, knows that it is not. However, average costs and average rates must run in lines more or less parallel purely as sound business policy.

The development of cost accounting in manufacturing plants, and its application by the Railroad Commission to

[1] *So. Wis. Cheesemen's Protective Ass'n.* v. *C. M. & St. P. R. Co. et al.*, 1906, 1 W. R. C. R., 153-154.

the public utilities of Wisconsin after five years of trial, would seem to disprove the contention that it is impossible to determine unit costs.

Recent improved methods of accounting render it possible to ascertain the cost of the product of each department in an industrial plant, and the separate cost of each process of finishing and manufacture. It accounts for the cost of material, labor, selling and other general expenses. Such systems measure the efficiency of the workmen, keep an exact record of all goods finished and their cost, show what departments or processes are profitable or unprofitable, "in short, there is hardly an activity in or about a business enterprise that cannot be shown up or accounted for by the most advanced cost system now in use."[1]

No large enterprise that assumes contracts in advance of the production or manufacture of the article could safely operate without such a cost system. It is an integral part of the industrial system of to-day. Adjustments in the accounts are so made as to show the exact cost of the material and labor at every stage of production. This exact cost is necessary to determine the price at which the article can be sold at a profit.

A railroad is likewise a productive enterprise. It has a plant to operate and maintain, a general office for supervision, an operating department to produce transportation and a traffic department that sells two kinds of service —passenger and freight. It usually requires separate trains and separate crews to furnish each class of service. As might be anticipated from a close examination of the accounts, a majority of the expenses of each branch of

[1] An illuminating comparison of cost accounting in manufacturing enterprises and how it can be applied to the railroad business, with a full discussion of the detailed separation of railroad accounts to determine the proper cost units, may be found in the *Buell* case, *op. cit.*, 393-407. Much of the above discussion is drawn from this source.

the service are direct and can be easily separated. Expenses common to both services, such as supervision, maintenance of way and structures, general expenses and other general items, cannot, however, be so readily segregated, "but must be divided upon some arbitrary basis." But in the traffic department, for example, an examination of the items of expense—salaries of passenger agents, freight agents; printing passenger tickets; freight tariffs; stationery and other office and general expenses—suggests a possible separation.

Thus the greater part of the direct expenses can be charged to each service separately through an arrangement of the expense items, though it is seldom done, as a perusal of railroad reports will disclose. Direct costs for transporting freight or passengers include "the train service and supplies, the locomotive service and supplies, station service and supplies and the maintenance of equipment and many other items."

Under most cost systems now in use the common or indirect expenses are apportioned in the main between the two services in proportion to the direct expenses. Items that depend more particularly on a special part of the service may be allotted to the unit of this service.

The feasibility of such a system of allocating railroad expenses to determine unit costs, by methods similar to those used in manufacturing plants, is well illustrated by the segregation of expense items and costs made by the Commission in the Buell two-cent fare case. There every item incident to each branch of transportation was tabulated in detail and apportioned with results that surprised even railroad managers. So satisfactory were the conclusions obtained, from this reclassification of accounts, that the Commission, after commenting upon the lack of advance among railroads with respect to the distribution of expenses between the productive departments compared

with similar cost statistics for other manufacturing enterprises, said that it[1] "can be justly drawn that the principles and methods of cost accounting which have been adopted in other industrial and commercial undertakings can, in the main, also be applied to railroad service. Some changes as to details may be necessary in the application of these principles, owing to differences in the respective enterprises, but no radical alterations would seem to be required." Cost units are of primary importance in any business industry, when viewed from an economic standpoint. Even the reduction of entangled railroad accounts to such a basis would seem to be practical.

In making freight rates the cardinal principle is that the charges shall be "reasonable." What is "reasonable" is difficult to determine. The courts do not define it. When presented with a specific case they will determine the issue in that one instance. The Wisconsin Commission has held that justice demands that the carrier is entitled to earn its operating expenses and a fair income on the value of its property;[2] that it should not be asked to establish rates that will produce less, nor allow carriers to maintain rates that will produce more; that it does not follow because one rate is low and another is high that both are unreasonable, but that "rates in the aggregate are too high when they afford the carrier more than a reasonable rate of compensation on the amount of its investment over and above the cost of doing the business and of keeping the road and equipment in a good state of repair."

The Wisconsin Commission recognizes two controlling factors in the making of a "reasonable" rate, cost and classification. Unless other influences enter, these predominate. In some cases either element, or both, may be modified by other existing conditions. Specifically stated the

[1] *Buell*, etc., 401.

[2] *Buell* v. *C. M. & St. P. R. Co.*, *op. cit.*, 339-340.

controlling factors are: (1) cost of the service per unit of transportation, (2) proper classification of the commodity carried.

Cost of the service is the first element to be considered. It is important because it makes possible the assessing of charges against shipments which are commensurate with the expenses that have been incurred in handling it for carload as well as less than carload and for large as well as small shipments.[1] The initial step to determine the unit costs of transportation is a separation of the expenses between freight and passenger service. Under the method employed by the Commission this involves the allocation of expenses according to the one hundred and sixteen separate accounts and a recombination that will show the approximate cost of the freight and passenger business. The freight and passenger expenses are again reclassified and allocated for each branch between: (1) terminal expense, and (2) the cost of movement between terminals.[2]

These classification processes require the most laborious and painstaking analysis, but statisticians have found that when the items have been put through the laboratory process "often 60 per cent of the expenses are found to be special in each case to the freight and the passenger traffic, and that the balance consisting of the fixed and common items bear so close a relation to certain factors in the business that they can be safely apportioned thereon."[3]

A separation of terminal and movement expenses is necessary, because the former is independent of the length of the haul and the latter varies with the length of the

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[1] *In re Rates on Pulp Wood, op. cit.*, 226.

[2] *In re Marathon County R. Co.*, 1911, 7 W. R. C. R., 397; *Ringle et al.* v. *C. M. & St. P. R. Co.*, 1911, 7 W. R. C. R., 182, 788; *Chippewa Sugar Co. et al.* v. *C. M. & St. P. R. Co.*, 1906, 1 W. R. C. R., 271.

[3] Erickson, Address before the National Association of Railway Commissioners, 1910, 28.

haul. Terminal expenses are made up primarily of station and switching costs. The expense of switching an empty car in, or a loaded car out, is about the same, independent of what the car contains, so that the cost as between different commodities per ton or hundredweight varies inversely as the number of tons in the car. So the Commission has determined that "the proper unit for the terminal expenses is the ton through the loaded car."[1] The cost per ton or hundredweight varies inversely with the loading of the car.

Movement expenses between terminals vary with the weight and distance. It costs about as much to move a ton of "dead weight" equipment[2] as a ton of revenue-producing freight. The greater the number of tons of "pay freight" carried the less the cost per net ton.[3] The cost unit of the movement expense is the gross ton mile, the gross tonnage including weight of car as well as pay freight.

The separation between terminal and movement expenses is of primary importance. Everyone familiar with freight rates knows that while rates increase with the distance the increase of the rates is much lower than the increase in the miles of haul. It would be a very unusual case where the rate for fifty miles is twice as great as the rate for twenty-five miles, or the rate for three hundred miles six times as great as for fifty miles. The explanation is that the terminal expenses, which constitute a very considerable proportion of the total expenses, remain the same no matter what the length of haul, so although the movement expenses do vary more nearly in accordance with the distance, the terminal costs reflected in the rates pre-

[1] *Eingle et al., etc., op. cit.*, 183.

[2] The ordinary freight car weighs about 16 tons.

[3] *Wis. Pulp & Paper Mfrs. v. C. & N. W. R. Co. et al.*, 1910, 6 W. R. C. R., 456.

vent the increase of the rate, representing the sum of the terminal and the movement costs, from increasing as fast as the distance.

Elements other than the average loading of commodities which affect the cost units for freight transportation are: (a) density of the traffic, (b) weight of article in proportion to bulk, (c) distance carried, (d) risk or liability to damage.

Movement expenses vary with the amount of car loading. The loading in turn is dependent largely upon the density of the traffic. It requires the same train crew and nearly the same equipment to carry a small quantity of freight as a larger quantity. The heavier the loading per car and train the lower the direct expenses in proportion to the units transported. Elaborating this idea and its effects upon the cost of transporting an article, the Commission has said:

"The heavier the traffic, other things being equal, the lower[1] the cost per unit. Less than carload traffic, however, is relatively much more costly than carload traffic. On roads where the proportion of the less than carload business is greater, the cost per unit is also likely to be relatively higher than is the case on roads where the less than carload business is relatively small. This might be true even when the total tonnage in the former case is somewhat greater. The less than carload shipments appear to have an even greater effect on the terminal than on the movement expenses. That this should be the case is also natural, since the former includes station and terminal expenses. But while there are some variations in the cost per unit due to conditions of this nature, these variations, as said, are not large." . . . "Heavier loading stands[2] for lower cost because it reduces the proportion of dead weight to pay freight. . . . Relatively lower amount of empty car mileage means lower cost because it

[1] *In re Rates on Cord Wood*, 1908, 2 W. R. C. R., 715.
[2] *In re Rates on Pulp Wood*, 1908, 2 W. R. C. R., 221.

means more effective use of the equipment of property of the carrier." "A high traffic density usually stands for a low cost per unit of transportation and a low traffic density for a high cost per unit of transportation." [1]

Similarly, commodities that are relatively light in proportion to their bulk require higher rates than those which are relatively heavy. The number of tons that can be loaded into a car of bulky light articles or material is less, and the ratio of "dead weight" equipment that must be carried in proportion to the load is greater. A typical illustration from a decision will suffice:

An ordinary freight car will weigh about fifteen tons. When a car of this kind is loaded with eleven tons of freight, there are thus about 1.36 tons of dead weight to haul for each ton of pay freight. When on the other hand the car has twenty tons of freight in it, there are only .75 tons of dead weight to one ton of pay freight. That these facts are important is readily seen when we remember that the freight rates must be largely based on both the weight and the space required, and when we find that, in so far as the actual haulage is concerned, it costs as much to transport a ton of dead weight as a ton of pay freight. . . . Since this is the case, it is also obvious that rates must be higher for those commodities which are relatively light, than for those which are relatively heavy.

Car loadings vary from five to forty tons, depending upon the bulkiness of the article. How costs per ton mile vary with the different car loadings is illustrated by an actual unit cost sheet. It illustrates the value of a scientific system as compared with the more flexible plan of basing rates on "intuition."

As shown by the following table, rates vary with the distance the freight is carried, though not in the same ratio.[2]

[1] *Harrison* v. *D. & W. R. Co.*, 1908, 2 W. R. C. R., 805.

[2] *Gregory Bros.* v. *C. M. & St. P. R. Co.*, 1908, 2 W. R. C. R., 797.

TABLE I

MOVEMENT COSTS

Loading in tons	Car weight in tons	Gross weight car and contents in tons	Movement costs per gross ton per mile	Total cost 1 car mile	Movement cost for net ton per mile
5	15	20	.287 cts	5.74 cts.	1.148 cts.
10	15	25	.287	7.175	.717
15	15	30	.287	8.61	.576
25	15	40	.287	11.48	.459
40	15	55	.287	15.785	.395

The proportionately increased rate for short distances, as compared with long distances, is largely due to the fact that the terminal expenses are as great for a ton carried ten miles as for a ton transported one hundred miles.[1] It is often found that the terminal expenses amount to 40 per cent or more of the total cost. "Since they are as great for a shipment going a short distance as for one going a long distance, it follows that the cost per ton mile must also be much greater in the former case."[2] For this reason rates for long distances do not furnish any satisfactory basis for rates for short distances. Investigations made by the Commission show that eliminating terminal costs, the movement expenses "vary with the distance and not far from in the same proportion."[3]

The liability of damaging an article transported also has an influence on the cost per unit. Hazards are attendant in nearly every undertaking. Consideration of risks assumed by the carrier in transporting freight is an element closely associated with the value of the article.

[1] *In re Rates on Milk and Cream, op. cit.*, 470.
[2] *Keogh Excelsior Mfg. Co., etc., op. cit.*, 749.
[3] *In re Rates on Pulp Wood*, 1908, 2 W. R. C. R., 275.

Where the value is low, the risk is low and the rate charged will show a recession due to the lack of influence by these two factors. The effect of risk in transporting articles is considered in the making of every rate as shown by the following from the Commission's decision:

> The proportion of the operating expenses proper[1] that should be borne by each commodity, depends largely upon the cost of transporting the same and upon the risks involved in this transportation. The cost in turn depends upon the amount that can be gotten into the car, the density of the traffic, the condition of the road and upon other factors of this nature. The risk involved depends largely upon the value of the articles and whether they are of such character that they are easily damaged. The proportion of the interest on the investment that should be borne by each commodity, depends largely upon the value of the products, competition and market conditions, the position of the shipper, and upon other factors of a similar character. Usually the rates should be high enough to cover the cost and the risk, and contribute something toward interest on the investment

Aside from these more specific elements that influence the costs there are other factors present in individual freight-rate cases, such as the grades, the characteristics of the road, and its equipment.[2] Still more important, however, is the relatively greater movement expense for the "way" freight, that stops at nearly every local station, compared with the "through" freight, which carries most of the shipments that are to go over one hundred miles.[3] The latter covers approximately twice as many miles as the former, but the way freight is usually more heavily loaded with products bearing relatively higher local rates. "The cost per ton mile of the movement expenses alone is often three times as great on the way freight, as for the through

[1] *In re Rates on Cord Wood*, 1908, 2 W. R. C. R., 708.
[2] *Elbertson* v. *C. St. P. M. & O. R. Co.*, 1905, 2 W. R. C. R., 598.
[3] *Buell*, etc., *op. cit.*, 490, 494.

freight or long-distance traffic."[1] This distinction should be made, however, that the unusually rapid advance in group rate schedules for short distances, a source of common complaint, is not based on costs, but rather upon the location of market and other general conditions within the group territory. Group rates and trainload rates are not encouraged by the Commission, because the schedules are not predicated on a scientific rate-making basis.[2]

For an accurate determination of these unit costs full statistical information is needed showing (*See* Table II, this chapter) number of loaded cars, number of loaded car miles, average weight per empty car, average weight of load in carload and less than carload shipments, average gross weight per loaded car for the leading commodities shipped, tons of freight, tons of freight carried one mile and other similar elements. Given these data the cost per unit for the different classes of traffic may be computed.[3] This information is not easily obtained. "Through close and detailed comparisons it has been found that the cost per unit of transportation is about the same on most of the roads that are operating in this state. There are, of course, some variations in this respect, but they are not so important as might appear to be the case. These variations are mostly due to differences in density and in the kind of traffic."[4] The changes from year to year in the volume of traffic also cause some variation in unit costs, but variations thus arising are obviated by computing averages for each unit covering several years past.

"The data thus referred to furnishes the means by which the average cost per loaded car and per gross and net ton of the terminal expenses, as a whole as well as by

[1] *Keogh Excelsior Mfg. Co.*, etc., 749, 750.

[2] *Elbertson*, etc., *op. cit.*, 604; *Edward Hines Lumber Co.* v. *C. St. P. M. & O. R. Co.*, 1908, 2 W. R. C. R., 391.

[3] *See In re Rates on Pulp Wood*, 1908, 2 W. R. C. R., 224, 226.

[4] *In re Rates on Cord Wood*, 1908, 2 W. R. C. R., 715.

classes, may be obtained under the various loadings per car," says Commissioner Erickson in discussing the conclusions that may be drawn from the calculations.[1] "These calculations are greatly facilitated by the fact that the greater proportion of the terminal expenses per car are about the same when it is heavy as when it is lightly loaded, a fact that tends to materially increase the importance of the average loaded car.

"From this data mentioned it is likewise possible to determine the cost per net ton per mile and the cost per gross ton per mile. The former cost is had when the movement expenses are distributed over the loaded car mileage. The latter is had when the cost per car mile is distributed over the gross weight, or on the weight of both average load and the average car. This cost per gross ton can then be so applied that it is possible to obtain the cost per net ton per mile under various kinds of loading and various other conditions that may arise.

"The unit costs which are thus obtained furnish the data upon which to compute the cost per cwt. to the carrier for transporting freight various distances under all sorts of loading. In making these computations it must be remembered that the terminal expenses are independent of the distance the freight is carried, and that they are about the same (*See* Table IV, this chapter) for a shipment going one hundred miles as for one going a greater or less distance than this and that the movement expenses, on the other hand, vary with the haul and not far from in the same proportion."

Even after the cost of the traffic units of transportation has been determined, there is still a second predominating element that enters into the making of a "reasonable" rate. This is the classification of the commodity.

[1] Address before the National Association of Railway Commissioners, Washington, 1910.

Strictly speaking "classification" applies only to those articles offered for transportation to which special or commodity rates do not apply. Using it, however, in the sense of the relative charges between articles it applies as well to goods carried under commodity tariffs. While the articles subject to commodity tariffs are relatively few as compared with the articles governed by the classifications, they are in the main articles that move in great volume, so that though comparatively few in number, they nevertheless constitute the great bulk of the freight tonnage. The fact that they do move in great volume makes it possible to deal with each one separately for rate purposes. The articles which take class rates, on the other hand, run into the thousands but do not move in any great quantities. Only a few of the separate articles afford large amounts of traffic, so that in actual practice it has been found convenient, if not absolutely necessary, to consider them in groups or "classes." The principles underlying commodity and class rates are, generally speaking, the same, but in working out the two types of rates there is this difference, that for commodity rates the costs of handling the separate commodity are worked out and then for rate purposes modified by the other factors entering into rate structure, i. e., value, liability to damage, etc., while for class rates the elements that affect costs, are considered in conjunction with the other factors.

Freight classifications are made by committees composed of representatives of the different railroads within a specified territory. There is no uniform classification applicable to the entire United States, although several attempts have been made to formulate such schedules.[1]

[1] Before the Interstate Commerce Law of 1887, nearly every road had its own classification. The requirement of the long- and short-haul clause of the act forced the change. *See* Noyes, American Railroad Rates, 67.

The impracticability of separate and conflicting classifications would seem to demand that one single uniform classification for the entire country would be both necessary and in line with public policy.

At the present time the United States is divided into three classification territories:

"Official" classification prevails north of the Ohio and Potomac rivers and east of the Mississippi River, excepting the state of Wisconsin, and the Michigan peninsula. Its committee headquarters are in New York.

"Southern" classification includes the territory south of the Ohio and Potomac rivers and east of the Mississippi. Its committee headquarters are in Atlanta.

"Western" classification includes Wisconsin, the northern peninsula of Michigan, and all territory west of the Mississippi River. Some of the Pacific Coast territory is under a separate classification, but this is considered as a subdivision of the "western" classification. The committee's headquarters are in Chicago.

In a number of states like Iowa, Illinois and several southern states separate state classifications are promulgated by law. The Railroad Commission of Wisconsin exercises the power to change any item in the "western" classification as applicable to the state. The Wisconsin law specifically requires that the classification of freight in the state shall be uniform for all railroads.[1]

In the "western" classification all commodities, except those included in commodity tariffs, are divided into five numbered (1-5) and five lettered (A-E) classes. Classes 1 to 4 cover shipments in less than carload lots (L.C.L.)[2]

[1] Sec. 1797-7 Revised Statutes of 1913.

[2] "Generally speaking, the chief features which it seems necessary to consider in determining the proper classification of an article are the space occupied by each one hundred pounds of the article, and the value per one hundred pounds of the same. The first is supposed to represent the amount of car space which the carrier must furnish

and classes 5 to E the carload (C.L.) shipments. Articles of the highest value, like dress goods, which take the highest rate, are put in Class 1 for less than carload and Class "A" for carload shipments, while the lowest priced articles and the lowest rates are represented by classes 4 and E, there being a gradual reduction in both for the intermediate classes. Commodity rates are lower than Class "E."[1]

To determine the relationship of each class within the freight classification to each other the Commission has made a compilation which shows that when the rates for Class 1 are represented by 100, the rates for the other classes bear roughly the following proportions: Class 2, 83; Class 3, 67; Class 4, 50; Class 5, 40; Class A, 45; Class B, 35; Class C, 30; Class D, 25; and Class E, 20. The compilation shows that taking the classification as it stands the average rate under the average loading for the entire traf-

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in the transportation of the article and the second is supposed to represent in a general way the risk, which the carrier assumes, as well as the ability of the commodity to be transported to bear a certain rate. Having determined the number of cubic feet of car space occupied by one hundred pounds of an article, and the value of one hundred pounds, both expressed decimally, these two items are added together and constitute what has been termed a classification unit. This is not an exact, but rather an approximate unit, which serves the purpose of comparison with articles already in the classification, or with articles still to be added to the valuation. A certain number of classification units are, theoretically at least, required of all of the commodities in a certain class. For instance, an article which represents between 15 and 20 units falls into the first class; an article which represents between 10 and 15 classification units falls into the second class; between 5 and 10 units third class; 5 or fewer units fourth class. These units may be regarded as index numbers giving the clue to the correct classification of any particular article. Obviously, a large number of different considerations enter into the classification of thousands of articles, and a unit rule of this kind must be regarded as applicable only in a general way."—*Medford Fruit Package Co.* v. *W. C. R. Co. et al.*, 1906, 1 W. R. C. R., 47.

[1] *In re Rates on Pulp Wood, op. cit.*, 227.

fic is denoted by 28, which would be a rate between classes C and D, as shown in Table IV of this chapter. When Class 1 is represented by 100 it follows that the rates for articles in this class should be 3.6 greater than this average, Class E, 70 per cent of the average and the rates for the other classes should bear the same relative proportions.

"This adjustment of rates may be considerably improved upon if the less than carload and the carload rates are dealt with independently of each other,"[1] declares Commissioner Erickson. "That this is the case is shown when in similar computations of the figures used herein, the position of the former is placed at 75 and that of the latter at 23."

As already indicated in the discussion of classification, there are several minor elements upon which the classification is built that are considered by the Commission in determining the weight of this factor as entering into the making of "reasonable" rates. These elements are: (a) value of the article, (b) relationship of rates between classes, (c) comparison of rates for similar service, (d) competitive relations of articles and carriers, (e) commercial and local conditions.

The primary consideration in the classification of freight is the value of the article transported. This is the first factor that must be considered in the classification in the adjustment of rates.[2] On this point the Commission says:

> The cost is the first element that should be determined[3] and this cost should then be modified by "what the traffic will bear."

[1] Address before the National Association of Railway Commissioners, Washington, 1910, 32-33.

[2] *Webb Produce Co.* v. *C. & N. W. R. Co.*, 1908, 3 W. R. C. R., 36; *Milwaukee-Waukesha Brewing Co.* v. *C. & N. W. R. Co.*, 1910, 5 W. R. C. R., 549.

[3] *In re Rates on Milk and Cream*, 1908, 2 W. R. C. R., 465-466.

Under these methods of fixing rates articles of a high value and high cost will be charged higher rates than articles of low value and low cost. Generally speaking no rate should be lower than sufficient to cover operating expenses and to contribute at least a small amount toward the interest upon the investment. There are perhaps conditions under which exceptions to this may be warranted, but they should not be numerous or general. No rates should be so high as to interfere with the free and unhampered movement of the goods, or yield unreasonably high profits when the situation as a whole is considered. Between these two extremes, or between the upper and lower level, there may be almost all sorts of rates. Some may be close to the bottom; others may be close to the top; while still others may be midway between the two limits.

On the high-priced article the rate of transportation constitutes only a small, perhaps insignificant, proportion of its value. An equally high rate on some other or low-grade commodity might easily prove prohibitive and prevent its shipment entirely. In other words, low-grade commodities cannot bear as high rates as high-grade ones. That rates should be so adjusted as not to prevent a reasonably free and unhampered exchange of products is of the greatest importance from both the economic and social point of view. When it is found that certain commodities cannot bear rates that will cover operating expenses plus their equal proportion of a reasonable profit on the investment, and that there are other commodities which can bear these costs and something besides, it is usual, and, for the reasons given, in line with the best interests of both the carriers and the public, to so adjust the rates that the former are made to contribute less and the latter more than their equal proportions of the interest on the investment.

There are commodities which could not be moved under higher rates than just about sufficient to cover operating costs and a small amount in the way of profits. On the other hand, there are a large number of commodities which can bear high rates that will not only cover operating expenses, but yield a very handsome surplus above these expenses, to be applied as interest or profits to the investment. These facts must be taken into con-

sideration as a matter of both business and public policy. It follows that the justice or fairness of each particular rate in the schedules, or in effect, depends upon the care and accuracy with which the freight is classified, and with which the rates of charges for each of these classes are adjusted.

Under these principles it will be found that in examining rate schedules, saw logs and crushed stone bear the lowest possible commodity rates, while the other extreme is represented by the high rates on dress goods.

The proportional relationship of rates to each other for different articles carried is embodied in the freight-rate classification that is subject to supervision and change by the Commission. It is an element that enters into the making of a final rate. Here the doctrine of charging "what the traffic will bear" would seem to have a practical application. Regarding this rate relationship the Commission says:

> The relation which the rates on the various classes of [1] freight and the various commodities ought to bear to each other are largely questions of classification. It depends upon such factors as the value of the articles, their bulk in proportion to their weight, the risks involved, the nature of the articles generally, and on many other factors.

Another element to be considered by the Commission is a comparison of the same rates for similar service. This is not as important an element as the other factors, although it has a bearing in individual cases. Comparison of rates is not considered a safe basis for rate-making. The rates with which comparison is made may be unreasonable or the result of peculiar conditions. While a compara-

[1] *Wis. Pulp & Paper Mfrs.* v. *C. & N. W. R. Co. et al.*, 1910, 6 W. R. C. R., 455, 849; *also see National Refining Co. et al.* v. *C. & N. W. R. Co.*, 1910, 6 W. R. C. R., 333, 843.

tive process will eliminate discriminations between shippers, it may also have the effect of allowing too high a return upon the investment.[1] Its every aspect must be carefully scrutinized before accepted. That the condition which surrounds the industry as a whole is an element, however, to be taken into consideration with other factors, is indicated by the following from a Commission's decision:

> While a comparison of the rate in controversy in the present[2] case with other rates does not in and of itself establish the unreasonableness of the former, yet where conditions are not dissimilar and the cost of transportation is not greater, it would seem that the variance in the rates is not justified.

A typical illustration of the use of comparative rates may be found in the investigation conducted by the Commission into the pulp wood rates in the state. It found that:

> The rates in Minnesota are about the same as in Wisconsin.[3] The rates in New York are lower to some points and higher to others than the rate in Wisconsin. The rates in Michigan, Maine, New Hampshire, Tennessee and Virginia are from 14 to 60 per cent lower than the rates for like distances in Wisconsin. As the paper produced in all of these states seems to come in competition with the paper produced in Wisconsin, these differences in the rates on the raw material are an element that should receive some consideration in this case.

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[1] *Milwaukee-Waukesha Brewing Co., op. cit.*, 549, 852; *Ringle et al., etc., op. cit.*, 600, 832; *Wisconsin Lakes Ice and Cartage Co.* v. *C. & N. W. R. Co.*, 1912, 9 W. R. C. R., 109, 628; *Wausau Paper Mills Co.* v. *C. M. & St. P. R. Co.*, 1912, 9 W. R. C. R., 404.

[2] *Krouskop* v. *C. M. & St. P. R. Co.*, 1910, 6 W. R. C. R., 186, 842.

[3] *In re Pulp Wood Rates, op. cit.*, 218-220; *see* comparison of rates with other similar forest products, 174.

Again competitive conditions must be considered. Competition would seem to be a stronger factor as between articles than between carriers. It may be so strong in some industries as to prevent producers entering certain markets. Unless this element is recognized and unless considered it may prevent the movement of a certain article of freight that will bear a small share in the necessary operating expenses and profits. The question has been touched upon in numerous decisions, thus:

> Another important element that enters into the question [1] of what rates the traffic can fairly bear is found in competitive conditions. It is often found that competition is so strong that the regular rate of transportation would entirely prevent producers from entering certain markets. Whenever such conditions are met with it is often to the best interests of both the carriers and the community that they shall be fully considered in adjusting the freight rates. If a slight shading in the rates will enable the articles to move, and if this shading can be made without unjust discrimination, it is usually best for all concerned that it should be made. . . . It is undoubtedly a fact [2] that, for strictly competitive undertakings, even so small an amount as one cent per cwt. on the raw material may prove quite detrimental. . . . The practice usually is to accept the traffic at the best rates it can be had provided the revenue derived therefrom is sufficient to cover the extra cost of handling this traffic when something is included in this cost for returns upon the investment, and provided further, that the rates and terms at which it is so accepted are not unjustly discriminatory.

The final factor to be considered is in reality only a corollary of the principle of competition above stated. Local and commercial conditions sometimes have an effect on the making of a reasonable rate. It has been recognized

[1] *Milwaukee-Waukesha Brewing Co., op. cit.*, 186, 842.

[2] *Webster Mfg. Co.* v. *C. St. P. M. & O. R. Co.*, 1910, 5 W. R. C. R., 96, 97.

as an independent element in a number of cases, as shown by the following paragraphs:

The effect of special and local conditions at various[1] points enters more or less strongly in the fixing of commodity rates.

The most important element in the fixing of rates is the[2] cost of the service, subject to modifications by reason of commercial conditions, such as the value of the article carried, the competitive situation of both the producer and the carrier.

The needs of the shipper and of the community should also[3] be taken into account in rate-making. But, important as these elements are, they are not often the only ones to be considered.

Not every element mentioned is of the same force and importance in every case. Summarizing our examination, we find that the two elements that control the rate-making situation are the unit cost of the service and the classification of the article. The others are modifying factors. Three tables have been prepared by Commissioner Erickson to illustrate the method of rate-making described in this chapter. Table II, already referred to, contains a statement of the general condition of the road, its finances, its traffic, mileage, with a reduction of the data into unit costs. Table III shows the amount of freight of each class carried and the revenue produced. *See* pages 140-142.

Using the facts in Tables II and III, and applying them to the elements of movement cost, terminal expense, and other factors in the classification, Table IV of normal unit costs for each class of commodity carried various distances is produced. These tariffs, when applied to practical cases, are sometimes modified by competition and commercial conditions explained above. They are so computed as to

[1] *Ringle et al.*, etc., 601.
[2] *Ibid.*, 600.
[3] *Elbertson* v. *C. St. P. M. & O. R. Co.*, 1908, 2 W. R. C. R., 600.

yield an average return of 8 per cent on the cost of the road, which on the basis of the physical value of the property, described in an earlier chapter, is fixed at $35,000 a mile. In Table IV, the rate of return on the less valuable classes of freight is computed low, compared with the rate allowed on the articles that are shipped in the higher classes.

Higher cost of way freight compared with through freight has also been recognized in Table IV. Way freight usually requires about a hundred-mile haul.[1] Reference to the table based on cost units discloses the diminution of the rate ratios with the distance of the haul and the relative importance of the terminal charge in all short hauls, regardless of the class of freight carried. The data at the bottom of Table IV gives ratios per cwt. for various classes and lengths of haul. The average cost per cwt. is about 7.3 cents for the average load, the average length of haul (147 miles), which falls between classes C and D. (Table IV.)

Bearing in mind the ratios of different classes within the classification schedule to each other, as already explained, a typical illustration, taken from Table II, will elucidate best the method used in making the classifications in Table IV. Take as an illustration the determination of a rate for a Class 1 article going the first ten miles or less. The average hauling cost per cwt. per mile for the average load of 15 tons is .287 mill (Table II). As previously stated, in discussing the question of classification, the position of the average rate under average loading for the traffic as a whole may be denoted by 28, which is found somewhere between classes C and D. A Class 1 rate will be five times greater than a Class E rate and 3.5 greater than the average rate.

Applying these principles, this gives an average rate of

[1] *Buell*, etc., *op. cit.*, 488.

(.287 mill x 3.5) 1 cent per cwt. as a Class 1 rate for the first ten miles of haul. Another factor now enters. It costs 50 per cent more for movement expenses to operate a way freight, that runs less than one hundred miles distance, than a through freight. For a Class 1 article carried ten miles or less this would give a movement rate of 1.5 cents per cwt. When the highest terminal rate of 8.4 cents [1] (Table II) per cwt. is added, it makes a total cost per cwt. of 9.9 cents for the first ten miles of haul. For the first one hundred miles the movement expense is increased at a rate of 1.5 cents per cwt., first class, for each ten miles distance the goods are carried.

Theoretically there should be separate tariffs for way and through freight. These, however, have been combined in one table. The movement rates under one hundred miles have been increased on the basis of data collected by the Commission as to the respective cost of the two kinds of traffic. This gives higher rates for way freight. For each ten-mile unit between one hundred and two hundred miles the rate is increased at a ratio of one-third of the movement cost for the first ten miles of haul. When two hundred miles is reached the original average movement rate of 1 cent for each ten-mile unit has again been obtained (First class two hundred miles the rate is 28.40 per cwt. less 8.40 terminal expense, gives a movement expense of 20, which divided by 20 ten-mile units gives an average 1 cent rate) and this basic rate is used for ten-mile units thereafter. The same principles of tariff-making, explained here, apply to the making of rates for other classes of freight shipped various distances.

Data in Tables II, III and IV are based on the traffic of a line taken as a whole. As most carriers operate in more than one state, a division between interstate and in-

[1] This high terminal rate is also apportioned so that Class E is one-fifth of the Class 1 terminal rate.

trastate earnings is often necessary.[1] It is a difficult process but not impossible. The accounts of the cost of transportation are usually kept by divisions. It has been found that 40 per cent of the cost items can be immediately located.

The efficacy of the cost system of rate-making is at once apparent. Its foundation rests upon the facts derived from the operation of the road. Ordinarily two hours of one Wisconsin commissioner's time is required every day to settle rate problems. In that time from twenty to one hundred rates are made or remade—an average of about forty a day.

Some of the cost data compiled by the Commission can be used in computing any rates, as the variation in units between the different carriers in the state is but slight. Much of it must be gone over for every article shipped between any two stations. The more rates involved the more laborious is the task. It is estimated that in the recent express rate case before the Commission at least 1,000,000 "basing rates" were involved. When the Interstate Commerce Commission made its decision on the same subject it changed the method of basing rates to the "zone system" and the number of separate rates was reduced. It involved, however, 130,000 separate rate computations to bring about uniformity between the decisions. Because of the local pick-up and delivery service, and specific contracts between carriers and the companies in many cases, express rates are higher than first-class freight rates.[2]

Other state commissions using less definite and scientific methods have been overruled in the courts many times in rate cases. Not a freight rate made by the Wisconsin Commission has suffered a reversal.

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[1] *Buell, etc., op. cit.*, 496.

[2] *In re Rates on Milk and Cream, op. cit.*, 468.

TABLE II

STATEMENT SHOWING SOME OF THE DATA FROM WHICH THE RATE SCHEDULE WAS COMPILED

Operating expenses and taxes	$ 22,952,930
Interest at 8 per cent on $133,525,000	10,282,000
Total expenses	$33,234,930
Proportion of expenses chargeable to freight traffic	71 per cent
Proportion of terminal expenses of total freight expenses	40 per cent
Total number of loaded cars	1,156,400
Total number of loaded car-miles	166,588,200
Average weight per empty car	15 tons
Average weight of load in loaded car	15 tons
Average gross weight per loaded car	30 tons
Tons of freight carried	16,396,709
Tons of freight carried one mile	2,431,794,827
Average distance each ton was carried about	147 miles
Length of main track	3,815 miles
Estimated cost per mile	$35,000
Total cost whole line	$135,525,000
Operating expenses and taxes charged to freight traffic	$16,296,583
Interest charged to freight traffic	7,589,220
	$23,885,803
Operating expenses and taxes charged as terminal expenses	$6,035,688
Operating expenses and taxes charged as movement expenses	9,777,950
Interest charged as movement expenses	4,553,532
Terminal operating expenses and taxes per loaded car	5.70
Terminal interest charges per loaded car	2.70
Total terminal expenses per loaded car	8.40
Terminal expenses per cwt. when car is loaded with 15 tons of freight	2.80 cts.
Terminal expenses per cwt. when car is loaded with 20 tons of freight	2.10 cts.
Terminal expenses per cwt. when car is loaded with 5 tons of freight	8.40 cts.
Movement operating expenses and taxes per loaded car-mile	5.87 cts.
Movement interest charges	2.74 cts.
Total movement expenses per loaded car-mile	8.61 cts.
Average movement expenses per gross ton per mile (8.61 cts. per L.C.M. ÷ 30 Gr. T. per L.C. per mile)	.287 ct.
Movement expenses per net cwt. per mile when car is loaded with 15 tons of freight (.287 ct. per Gr. T. per mile × 30 Gr. T. = 8.610. 8.610 ÷ 300 = .287 mill)	.287 mill
Movement expenses per net cwt. per mile when car is loaded with 20 tons freight (.287 × 35 = 1,435. 1,435 ÷ 400 = .251 mill)	.251 mill

TABLE II—(*Continued*)

STATEMENT SHOWING SOME OF THE DATA FROM WHICH THE RATE SCHEDULE WAS COMPILED

Movement expenses per net cwt. per mile when car is loaded with 5 tons of freight (287 × 20 = 5,740, 5,740 ÷ 100 = .574 mill)	.574 mill

TABLE III

FREIGHT IN EACH CLASS AND THE AVERAGE AND TOTAL REVENUE FROM THE SAME

Classes	Tons one mile	Cents per ton-mile	Total Revenue
1	43,000,000	3.50	$1,505,000
2	43,000,000	2.90	1,247,000
3	43,000,000	2.32	998,000
4	43,000,000	1.75	744,000
5	105,500,000	1.40	1,497,000
A	90,000,000	1.60	1,444,000
B	150,000,000	1.22	1,830,000
C	226,500,000	1.06	2,419,000
D	310,000,000	.87	4,439,000
E	550,000,000	.71	3,930,000
Com	627,800,000	.61	3,850,000
	2,431,800,000	0.98	$23,885,000

TABLE IV

Rates in Cents Per Cwt. Based Upon the Adjustment Described in the Text

Distance	Classes										Commodities
	1	2	3	4	5	A	B	C	D	E	
Terminal expenses cts. per cwt.	8.40	6.97	5.63	4.20	3.36	3.78	2.94	2.52	2.10	1.68	1.43
Movement expenses cts. per cwt., 10 miles	1.50	1.26	1.01	.75	.60	.68	.53	.45	.375	.30	.26
Total cost per cwt. for 10 miles	9.90	8.23	6.64	4.95	3.96	4.46	3.47	2.97	2.475	1.98	1.69
Total cost per cwt. for 20 miles	11.40	9.49	7.65	5.70	4.56	5.14	4.00	3.42	2.85	2.28	1.95
Total cost per cwt. for 30 miles	12.90	10.75	8.66	6.45	5.16	5.82	4.53	3.87	3.225	2.58	2.21
Total cost per cwt. for 40 miles	14.40	12.01	9.67	7.20	5.76	6.52	5.06	4.32	3.60	2.88	2.47
Total cost per cwt. for 50 miles	15.90	13.27	10.68	7.95	6.36	7.18	5.59	4.77	3.975	3.18	2.73
Total cost per cwt. for 60 miles	17.40	14.53	11.69	8.70	6.96	7.86	6.12	5.22	4.35	3.48	2.99
Total cost per cwt. for 70 miles	18.90	15.79	12.70	9.45	7.56	8.54	6.65	5.67	4.725	3.78	3.25
Total cost per cwt. for 80 miles	20.40	17.05	13.71	10.20	8.16	9.22	7.18	6.12	5.10	4.08	3.51
Total cost per cwt. for 90 miles	21.90	18.31	14.72	10.95	8.76	9.90	7.71	6.57	5.475	4.38	3.77
Total cost per cwt. for 100 miles	23.40	19.57	15.73	11.70	9.36	10.58	8.24	7.02	5.85	4.68	4.03
Total cost per cwt. for 110 miles	23.90	19.99	16.07	11.95	9.56	10.81	8.41	7.17	5.97	4.78	4.12
Total cost per cwt. for 120 miles	24.40	20.41	16.41	12.20	9.76	11.04	8.58	7.32	6.09	4.88	4.21
Total cost per cwt. for 130 miles	24.90	20.83	16.75	12.45	9.96	11.27	8.75	7.47	6.21	4.98	4.30
Total cost per cwt. for 140 miles	25.40	21.25	17.09	12.70	10.16	11.50	8.92	7.62	6.33	5.08	4.39
Total cost per cwt. for 150 miles	25.90	21.67	17.43	12.95	10.36	11.73	9.09	7.77	6.45	5.18	4.48
Total cost per cwt. for 160 miles	26.40	22.09	17.77	13.20	10.56	11.96	9.26	7.92	6.57	5.28	4.57
Total cost per cwt. for 170 miles	26.90	22.51	18.11	13.45	10.76	12.19	9.43	8.07	6.69	5.38	4.66
Total cost per cwt. for 180 miles	27.40	22.93	18.45	13.70	10.96	12.42	9.60	8.22	6.81	5.48	4.75
Total cost per cwt. for 190 miles	27.90	23.35	18.79	13.95	11.16	12.65	9.77	8.37	6.93	5.58	4.84
Total cost per cwt. for 200 miles	28.40	23.77	19.13	14.20	11.36	12.88	9.94	8.52	7.05	5.68	4.93
Total cost per cwt. for 220 miles	30.40	25.45	20.49	15.20	12.16	13.78	10.62	9.12	7.53	6.08	5.27
Total cost per cwt. for 240 miles	32.40	27.13	21.85	16.20	12.96	14.68	11.30	9.72	8.01	6.48	5.61
Total cost per cwt. for 260 miles	34.40	28.81	23.21	17.20	13.76	15.58	11.98	10.32	8.49	6.88	5.95
Total cost per cwt. for 280 miles	36.40	30.49	24.57	18.20	14.56	16.48	12.66	10.92	8.97	7.28	6.29
Total cost per cwt. for 300 miles	38.40	32.17	25.93	19.20	15.36	17.38	13.34	11.52	9.45	7.68	6.63
Total cost per cwt. for 320 miles	40.40	33.85	27.29	20.20	16.16	18.28	14.02	12.12	9.93	8.08	6.97
Total cost per cwt. for 340 miles	42.40	35.53	28.65	21.20	16.96	19.18	14.70	12.72	10.41	8.48	7.31
Total cost per cwt. for 360 miles	44.40	37.21	30.01	22.20	17.76	20.08	15.38	13.32	10.89	8.88	7.65
Total cost per cwt. for 380 miles	46.40	38.89	31.37	23.20	18.56	20.98	16.06	13.92	11.37	9.28	7.99
Total cost per cwt. for 400 miles	48.40	40.57	32.73	24.20	19.36	21.88	16.74	14.52	11.85	9.68	8.33
Movement expenses 10 miles:											
1st 100 miles	1.50	1.26	1.01	.75	.60	.68	.53	.45	.375	.30	.26
100 to 200 miles	.50	.42	.34	.25	.20	.23	.17	.15	.12	.10	.09
Over 200 miles	1.00	.84	.68	.50	.40	.45	.34	.30	.24	.20	.17

CHAPTER X

MAKING OF UTILITY RATES

Both the public and the investor find the subject of utility rates of primary importance. The price charged for the service determines the income of the utility and the sacrifices that the individual must make to obtain the service. Unreasonable rates, discriminatory or excessive, are contrary to good public policy. If the rates are unjust or preferential, money is wrongfully transferred from the pockets of one consumer to another. Rates must be scientifically adjusted so that each consumer pays for the cost of his service. They must be high enough to attract capital legitimately into the enterprise, but they should be low enough to yield only reasonable profits above interest and depreciation upon a fair value of the property. Rates that are too low result ultimately in poor service, the crippling of development, and sometimes in a discontinuance of the service.[1]

Wisconsin public utility rates, as computed by the Commission, are prepared on the cost of the service basis. To determine these rates requires the fullest information as to the value of the property, the total cost of each branch of the service, a detailed analysis of output, a classification of the items of expense and a just apportionment of these items among the departments rendering service. It takes

[1] In the preparation of this chapter the writer has drawn from two papers prepared by Commissioner Erickson on "The Making of Water Rates" and "Rates for Electric Current," both of which are extensive discussions of the technique of the subjects treated.

into consideration depreciation, interest on investment and profit and the character of the service rendered.[1] The processes followed in determining the rates for each class of utility are similar. For the purpose of making a full explanation of the method, the distribution of the expenses and the making of cost of service rates for a water company are selected as an example.

Total expenses are analyzed to determine the proper cost units. These expenses depend upon three important factors:[2]

Consumer expense.

Demand or capacity expense.

Output cost.

What is meant by consumer expense, involving such items as the cost of reading meters, is self-evident. The Commission in a leading case on the subject of unit water costs said:[3]

> Having determined the total cost of the service, the next problem is to so distribute this cost that all of the different classes of consumers will bear their just share of the burden. Before the extent of this burden can be ascertained, it is necessary to separate the operating expense into capacity and output expenses. The Commission has repeatedly pointed out the distinction between capacity and output expenses. In every business there are certain expenses which are directly dependent upon the output. As the output increases or decreases, these expenses will increase or decrease. But there is a large class of expenses which are

[1] *See* data on life of utilities, *In re Fond du Lac Water Co.*, 1910, 5 W. R. C. R., 502, 817.

[2] Cases followed in the apportionment over output, capacity and consumer expenses: *Dick et al.* v. *Madison Water Commission*, 1910, 5 W. R. C. R.; *City of Janesville* v. *Janesville W. Co.*, 1911, 7 W. R. C. R., 651, 789; *Fitzgerald et al.* v. *City of Tomahawk*, 1911, 8 W. R. C. R., 40, 47, 761; *City of Marinette* v. *City Water Co. of Marinette*, 1911, 8 W. R. C. R., 365, 761.

[3] *Dick et al.* v. *Madison Water Commission*, 1910, 5 W. R. C. R., 757, 803.

incurred more or less independently of the output. To maintain a water plant in readiness to supply service requires a large expense, although no demand may ever be made upon the system. Some expenses partake of the nature of both. These must be distributed over capacity and output as nearly as it can be done. Again, some expenses are directly chargeable against the municipality, or against some other class of consumers.

After these three costs have been obtained, the items are again allocated between the different departments of the service, and again over the different classes of consumers. To obtain these results entails an analysis of a maze of accounts and data to determine the actual unit cost of service.

In practically every water plant two distinct services are rendered:[1] (1) The supplying of large quantities of water, usually under high pressure, for relatively short periods of time for fire protection. This is a public use. (2) The supplying of water at all times for commercial and industrial uses. This is a private purpose.

Until scientific investigations were made by the Commission there seems to have been a general opinion, especially where municipal plants were operated, that the commercial and industrial revenues should pay the entire cost of operating the plant. Even privately owned plants, operated under a franchise, seemed to incline toward this position.

There appears to be a wide difference of opinion between engineering authorities as to what proportion of the total expense should be borne by each class of consumers. Some contend that the fire service should pay interest only on the excess investment above what would be required of a plant to render general service. Others claim that the

[1] *Dick et al.* v. *Madison Water Commission*, 1910, 5 W. R. C. R., 757, 803.

plants are more often designed for fire protection and the serving of private users is incidental. The Commission, in its decisions, considers that both branches are coördinate.[1] Each bears the burden of interest, depreciation and profits, according to the apportionment of the existing plant based on the relative cost of separate systems.[2]

"The proportion of the investment necessary for the public service may vary somewhat, depending upon the local conditions," says the Commission in a recent decision.[3] It has been held by the engineers and water-works men whose experience and study of the question makes their opinion of weight, that this proportion will but seldom, if ever, go below 50 per cent of the cost of the plant and system. In those cases where the Commission has investigated the matter in detail and has made a separation between public and private, or domestic use, the proportion of total investment chargeable to public use has been found greatly to exceed 50 per cent.

The demand which the plant must be able to meet at any time, and the amount of water pumped or supplied to consumers, and the number of consumers to be supplied, influence the operating expenses of the plant.[4] The classification of the operating expenses depends largely upon the nature of the different expense items. Not all expenses depend entirely upon the amount of water pumped. A de-

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[1] *City of Ashland* v. *Ashland Water Co.*, 1909, 4 W. R. C. R., 297, 806.

[2] Leading cases followed in apportionment of investment between public and private use: *City of Ashland* v. *Ashland Water Co.*, 1909, 4 W. R. C. R., 273; *City of Ripon* v. *Ripon Light and Water Co.*, 1910, 5 W. R. C. R., 1, 66; *Dick et al.* v. *Madison Water Commission*, 1910, 5 W. R. C. R., 731, 757, and *City of Beloit* v. *Beloit Water, Gas and Electric Co.*, 1911, 7 W. R. C. R., 187, 310.

[3] *In re Application Jefferson Municipal El. Lt. & W. Plant*, 1910, 5 W. R. C. R., 578, 803.

[4] *City of Ashland* v. *Ashland W. Co.*, 1909, 4 W. R. C. R., 273, 286, 292, 295, 805.

crease in the amount of output will not reduce the expense of operation by a corresponding ratio. A considerable part of the expense results from keeping the plant ready to serve the largest demand that it is possible to make upon it at any time. In the mind of the Commission the primary consideration is so to distribute the various items of cost that each branch of the service, and each customer and class of customers, will bear their just burden of the total costs.[1]

Because a relatively small proportion of the water pumped is used for fire protection, it follows that but a small proportion of the expense which varies with the amount of water pumped should be borne by the fire protection service. From an analysis of a number of water plants, Commissioner Erickson declares that only from 1 to 2 per cent of the total amount of water pumped is used for fire service. Recently the Commission held:[2]

> The determination of the proper charge to the public for fire service rests largely upon the matter of investment. The amount of water used has practically no effect on the final result, as the quantity consumed for fire service is practically negligible.

Likewise the share of consumer expense applicable to fire service is small, as it consists of little more than the looking after the hydrants. Fire service charges are made up largely of fixed charges and standby expenses, incident to the large demands it may make on the system at any time. The amount of capacity expense that is charged against any consumer "is the price[3] that in justice he should pay for the right of demanding service from

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[1] *Dick et al.* v. *Madison Water Commission*, 5 W. R. C. R., 757, 803.

[2] *City of Beloit* v. *Beloit W. G. & El. Co.*, 1911, 7 W. R. C. R., 336, 841.

[3] *Dick*, etc., *op. cit.*, 757, 803.

the utility, however great or small that service may be."

The next step in the separation of the cost of fire protection from that of general service is the segregation of the operating expenses between capacity, output and consumer charges based on the elements that influence each item. Generally speaking, the Commission has found that in the average typical plant the capacity expense would amount to about 38 per cent, the consumer expense to 18 per cent and the output expense to about 44 per cent of the total operating charges.[1]

For the output expenses the accepted basis of apportionment is the actual consumption of water for municipal and private purposes.[2] The capacity cost is divided between the two branches of service on the basis of the proportion of the investment required to meet the demands for service.[3]

For example, in a typical water plant the fire demand may be 1,200 gallons per minute while the demand for industrial and domestic service may reach 1,000 gallons per minute. On the basis of these demands 54.5 per cent of the capacity part of the operating expense should be apportioned to fire and 45.5 per cent to general service.

Consumer expenses are allotted generally on the basis of the number of consumers. The taxes, depreciation and interest are apportioned among the amounts invested in each separate division of the property.[4]

With the cost of the service ascertained, with the allocation of this expense between capacity, output and consumer's costs, and with the apportionment of these three

[1] Erickson, Address on water rates, p. 11.

[2] *In re Application Jefferson Municipal El. Lt. & W. Plant*, 1910, 5 W. R. C. R., 578, 804; *Kirwin et al.* v. *City of Darlington*, 1910, 6 W. R. C. R., 36, 781.

[3] *City of Ripon* v. *Ripon Lt. & W. Co.*, 1910, 5 W. R. C. R., 62, 804.

[4] *Fitzgerald et al.* v. *Tomahawk*, 1911, 8 W. R. C. R., 47, 762.

classes of expense between the two branches of service, the task remains of distributing the capacity, output and consumers' costs over the private water users so that each will pay his just share toward the total revenues necessary to operate the utility.

Where the city is the purchaser the formation of schedules is comparatively simple. The conclusion reached by the Commission in numerous decisions is that the cost of fire service should be treated as a whole, regardless of the number of hydrants or miles of mains; that it should be charged to the municipality in a lump sum and that the cost of new extensions should be covered by separate charges.[1]

Domestic and industrial water rates are more complicated in the making. It necessitates complete consumer and demand data from the records of the plant with a correct distribution of the capacity and consumer cost upon the amount of water sold. These unit costs must be modified in the light of local conditions. Under the rulings of the Commission capacity cost must be borne by each consumer in proportion to his demand upon the plant, or the investment and other demand costs his demand represents. A consumer with a three-inch pipe may use no more water than one with a one-inch pipe, but he makes a correspondingly larger demand upon the plant.[2] Capacity and consumer expenses are in the nature of fixed charges, which continue whether the customer uses little or no water. In some rate schedules they appear as service or demand charges; in other schedules they are covered by the minimum bill.

It only remains to provide a charge that will cover the actual output cost. A meter charge is arrived at by dividing the total output expense with the number of units of

[1] *Marinette* v. *City W. Co.*, 1911, 8 W. R. C. R., 366, 385, 825.
[2] *Dick et al., op. cit.*, 765, 837.

water sold. When it is impracticable to cover the entire demand cost in a separate charge it is often necessary to include at least a part of it in the output charge.

These reasonings suggest a schedule for water service furnished to domestic and industrial users that is composed of a service charge covering the capacity and consumer expenses, plus a meter charge based on the number of thousand gallons of water used. It is a rule followed by the Commission in most cases to adopt meter charges that decrease in amount with each successive increase in the amount of water used. This graduation is ordinarily known as the cost method of rate-making, where each consumer pays, as nearly as practicable, the cost of the service he obtains. It requires laborious and tedious processes of calculations to arrive at the results. Fairness to the consumers would seem to justify the labor.

In order to better illustrate the method of rate-making, Commissioner Erickson recently made an analysis of a typical municipally owned water company. Using the methods of apportionment already explained, Mr. Erickson said:

The cost of this plant and its business was about $150,000. On this amount the taxes, depreciation and interest charges at 6 per cent amounted to $9,000 annually. The operating expenses proper footed up to about $11,586.60 for the year.

Of the fixed charges of $9,000 the fire service was allotted $4,800 or 60 per cent and the general service $4,200 or 40 per cent.

Of the operating expenses of $11,586.60, the capacity cost amounted to $4,374.13 or 37.75 per cent; the output cost to $5,153.35 or 44.48 per cent and the consumer cost to $2,059.12 or 17.77 per cent.

When of this demand cost in the operating expenses 54.5 per cent is allotted to the fire service and 45.5 per cent to the general service; when the output cost is divided on the basis of 2 per cent

for the fire and 98 per cent for the general service; and when the fire service is made to bear about 5 per cent of the consumer cost and the balance thereof goes to the general service the results are about as follows:

	Fire	General
Capacity	$2,383.90	$1,990.23
Output	103.07	5,050.28
Consumer	9.77	2,049.35
Totals	$2,496.74	$9,089.86

When the $2,496.74 for operating expenses of the fire service are increased by the $4,800 which this service is made to bear for the fixed charges the total annual cost of the fire service is $7,296.74.

When the operating expenses of $9,089.86, as above apportioned, are increased by $4,200 for fixed charges, or for taxes, depreciation and interest, and when these fixed charges are allotted to the capacity, output and consumer cost on the same basis as the operating expenses, the total cost of each of these classes and for the general service as a whole is as follows:

For General Service Only

Capacity	$3,576.99
Output	6,919.70
Consumer	2,793.17
Total	$13,289.86

When for general service the consumer cost of $2,793.17 is distributed among the 1,200 consumers of the plant the average for each is $2.33. When the output cost of $6,919.70 is distributed on the 150,000,000 gallons of water sold, the average cost per 1,000 gallons is about 4.61 cents. The number of meters and services used and their sizes were as follows:

Size in inches	Meters
⅝	1,100
¾	50
1	20
2	15
3	10
4	5
Total	1,200

The following table shows the consumer charge per consumer, the capacity charge for each of the various sizes of meters and services and the total for both. This total in rate-making is often included in one charge which is named "service charge." The table also shows the total revenue for the year that would be derived from such "service charges." It will be noted that the total amounts to $5,900 or to $470.16 less than the sum of the capacity and the consumer costs given above which amount to $6,369.16, or to $3,576.99 for the former and to $2,993.17 for the latter. This difference arose mostly from the fact that round figures were used in computing the capacity charges for each class of meters. This balance of $470.16 can easily be cared for by a readjustment of the figures or by including it in the output cost which is the basis for the meter charge.

Total Service Charges Per Year

Size of meter	Total service charge	Consumer charge	Capacity charge	Number of meters	Total revenue from service charge
⅝ inch	$4.00	$2.33	$1.69	1,100	$4,400
¾ inch	6.00	2.33	3.69	50	300
1 inch	10.00	2.33	7.67	20	200
2 inch	20.00	2.33	17.67	15	300
3 inch	40.00	2.33	37.67	10	400
4 inch	60.00	2.33	57.67	5	300
Total	.....	.....	.....	.....	$5,900

When the demand costs are assigned to the meters and services somewhat in proportion to their size it is thus found that the cost per meter or service will also vary with the size of the same.

These figures suggest a rate schedule for the general service in which the service charge per quarter ranges from $1 for the ⅝ inch meters to $15 for the 4-inch meter plus a meter charge of six cents per 1,000 gallons of water for the first 40,000 gallons and about 4.5 cents per 1,000 gallons for all consumption in excess of this. This schedule on the basis of the conditions given would yield a trifle more revenue than the cost for the general service given above, which was about $13,289.86.

These figures and facts suggest further that the cost of fire protection service is represented by $2,496.74 for operating expenses and by $4,800 for taxes, depreciation and interest and that the sum of these items, which is $7,296.74, should be to the city as the annual charge for such protection.

MAKING ELECTRIC AND GAS RATES

Practically the same principles in the division of fixed and variable expenses, and the classification of items of cost, are used by the Commission in making rates for the sale of gas and electricity.[1] Numerous decisions by the Commission show that the fixed expenses in these plants are high. The plant investment is usually several times greater than the annual gross earnings. Electricity and gas cannot be stored for long periods and sold as are manufactured goods. Both gas and water must be kept under heavy pressure at all times, entailing gerat expense.

To furnish adequate service an electric lighting enterprise must be able to furnish a complete demand instantaneously. Obviously this renders the cost per unit higher than if there were a constant demand. In other words, this demand that may be made upon the plant at any time

[1] *City of Ripon* v. *Ripon Lt. & W. Co.*, 1910, 5 W. R. C. R., 56, 875.

fixes the amount of investment necessary to continue the enterprise consistent with good service.

The cost of supplying gas and electricity, as pointed out in the analysis of water plants, is divided between fixed and variable expenses.[1] The former depends upon the capacity or maximum demand and the latter on the amount of output.[2] The relation of these expenses to each other depends much upon the management of the plant and local conditions.

The rates fixed by the Commission are ascertained by computing a fixed charge based upon the consumer's demand and a variable charge per unit of electricity used. A typical illustration of the method employed is contained in some of the literature sent out by the Commission:

Assume a plant that has a capacity of 300 kilowatts; that has an average daily use of current of about five hours; that has an operating expense, including taxes and interest on the investment, to the amount of about $18,000 for the year, of which about two-thirds is covered by the fixed, and about one-third by the variable expenses, and that has a connected load and an instantaneous maximum demand that about equals the capacity of the plant. This is a situation that is probably not often, if ever found in actual practice, but it is assumed here for the sake of simplicity or convenience in figuring. These figures, together with the annual output of current as below given, furnish the material by which the principles laid down in the preceding pages may be illustrated. It should also be noted that in actual experience it is found that the proportion of the fixed expenses is apt to vary greatly with the conditions, and that

[1] Leading cases followed in apportionment of electric expenses: *In re Application Stoughton Mun. El. Lt. System*, 1909, 3 W. R. C. R., 490; *In re Menominee & Marinette Lt. & Tr. Co.*, 1909, 3 W. R. C. R., 831. Gas Utility Apportionment: *State Journal Printing Co. et al.* v. *Madison Gas & Elec. Co.* 4 W. R. C. R., 735, 737; *City of Racine* v. *Racine G. Lt. Co.*, 6 W. R. C. R., 304, 309.

[2] *City of Whitewater* v. *Whitewater El. Lt. Co.*, 1910, 6 W. R. C. R., 141.

all of the main classes of expenses, including both interest and depreciation, are in most cases likely to include both fixed and variable items.

The annual output of current for this plant is as follows:

1-hr. operation daily	109,500 kw. hrs.
2-hr. operation daily	219,000 kw. hrs.
3-hr. operation daily	328,500 kw. hrs.
5-hr. operation daily	547,500 kw. hrs.
10-hr. operation daily	1,095,000 kw. hrs.
24-hr. operation daily	2,628,000 kw. hrs.

The fixed expenses on the basis stated amount to about $12,000 for the year, or to $40 per kilowatt per year. This expense remains the same whether the plant is operated one, two or three hours daily, or even if it is in operation all day.

As the total fixed expense remains the same, regardless of output, and as the output in kilowatt hours increases with increase in the number of hours of daily operation, it must also follow that the fixed cost per kilowatt hour decreases with increases in the output.

The fixed cost per kilowatt hour for instance is:

11.00 cts. when the plant is in operation 1 hour daily
5.50 cts. when the plant is in operation 2 hours daily
3.66 cts. when the plant is in operation 3 hours daily
2.20 cts. when the plant is in operation 5 hours daily

The variable expense of this plant is:

$3,000 when the plant is in operation 1 hour daily
6,000 when the plant is in operation 2 hours daily
9,000 when the plant is in operation 3 hours daily
15,000 when the plant is in operation 5 hours daily

In other words, the variable expenses are increasing with increases in the output and not far from in the same proportion.

Since the total variable expenses thus vary with the output, or with the hours of daily use of current, it must also follow that the variable expense per kilowatt hour is about the same

when the plant is used one hour each day as when used three or more hours daily. In the plant in question here the variable expense per kilowatt hour amounts to about 2.77 cents.

The total cost of current, as stated, is thus made up of a fixed and a variable expense. When the fixed and variable costs are thus added together, it is found that the totals of both per kilowatt hour are:

Fixed		Variable	Total	
11.00	plus	2.77	13.77	cts. when plant is in oper. 1 hr. daily
5.50	plus	2.77	8.27	cts. when plant is in oper. 2 hrs. daily
3.66	plus	2.77	6.43	cts. when plant is in oper. 3 hrs. daily
2.20	plus	2.77	4.97	cts. when plant is in oper. 5 hrs. daily

Nothing illustrates better the fallacy of flat rates or the uniform rates per lamp, or per kilowatt hour, than the above table.[1] It shows that rates designed, without regard to installation and maximum demand of the consumers, must be discriminatory and inequitable. "A man having an installation and demand of two kilowatts, and using his current only one hour per day, consumes no more current than the man who has an installation and demand of one kilowatt, but who is using his current two hours daily,[2] yet the investment for the former must be twice as great as that for the latter. Under these circumstances it is manifestly clear that the same rate per kilowatt hour for both cannot be a just or fair rate." As disclosed by the above unit cost table the cost per kilowatt hour for the first consumer is 13.77 cents and for the second 8.27 cents per kilowatt hour.

A glance at the tables showing the method of cost of service rate-making illustrates how rapidly the costs decline with an increase of business. Nearly two-thirds of the total expenses of the service, including fixed charges,

[1] *City of Ripon* v. *Ripon Lt. & W. Co.*, 1910, 5 W. R. C. R., 34, 864.
[2] *In re Application Menominee & Marinette Lt. and Tr. Co.*, 1909, 3 W. R. C. R., 830.

are independent of the amount of current generated and sold. It follows that the larger the output up to the point where the full capacity of the plant is utilized the better is the load factor and the lower the cost per unit of current will be.

A rate schedule based on this cost of service principle results in higher average rates per kilowatt hour for the short- than for long-hour users. Residences are usually short-hour users and power customers are usually long-hour users. Numerous decisions worked out on this cost-basis principle, show the wide difference in rates possible under this plan, that cannot be considered as unjustly discriminatory, as between long- and short-hour consumers.

For example, a recent decision showed the average cost per kilowatt hour for lighting rates was 6.2 cents, street lighting 5.2 cents, power 4.2 cents, and traction service 1.9 cents. Lower rates for large power users increase the output and spread the high fixed expenses over a large field, reducing unit rates for all classes proportionately.

"A high load factor stands for low costs," said Commissioner Erickson recently,[1] "but a satisfactory load cannot often be obtained without rate schedules that for each branch and class of service are as closely adjusted to the cost as is practicable under the circumstances. In the operation and management of a public utility, there is no feature that is of greater importance, either to the utility or its customers, than a properly adjusted rate schedule."

This task of making the so-called cost of service rates requires an analysis of the most complete and detailed cost figures obtainable under the method of uniform accounting. These data are obtained under the classification of accounts discussed in an earlier chapter. Such an analysis,

[1] Article on "Electric Rate Making." *Annals of the American Academy of Political and Social Science*, May, 1914.

when the items of expense are properly allocated over the different departments of service and classes of customers, results in placing all users on an equitable footing, and forces the plants on a sounder business basis.[1]

[1] The relationship of the cost of service principle to rate-making will be discussed more fully in Chapter xii.

CHAPTER XI

STREET AND INTERURBAN RAILWAYS

Although experimentation began in 1835, both in this country and in Europe, the electric railway did not become a commercial possibility until about 1888. The early urban railway transportation was furnished by animal, cable and steam power. When the first United States census was taken of the industry in 1890 it was found that in the neighborhood of 69 per cent of the total street railway mileage and 60 per cent of the passenger traffic were still conducted by horse or mule traction systems. The electric railways at that time carried only 7 per cent of the passengers and operated 16 per cent of the track mileage. The growth of this method of transportation has been phenomenal. Since 1890 the trackage increased from 1,262 miles to 41,022 in 1912—a thirty-two-fold increase within twenty-two years—and it has now almost entirely superseded all animal and cable systems and steam railways. The percentages and figures given also include the development of interurbans since 1894, when they became successful through the economical transmission of electricity over comparatively long distances. The real expansion of interurbans, however, began somewhat later than 1894.

Going back one finds that in 1886, according to the census, only two electric railways operated in this entire country. About that time a system was installed in Appleton, Wisconsin. It was undoubtedly one of the pioneers, for its charter bears the date, January 1, 1886, and in 1890 it was

reported as having 3.5 miles of track in operation. Soon afterwards there were four other electric railways in Wisconsin. One operated in Eau Claire, another in Superior and two in Milwaukee. The total trackage of these railways was 45.5 miles. Besides these were nine animal power systems and one steam power. To show the condition of street railway transportation it may be stated that in the city of Milwaukee, for instance, five separate systems operated in 1890: two electric systems, two animal systems and one steam dummy line.

Twelve years later in 1902 twenty systems with approximately 446 miles of electric railway track were in operation in Wisconsin—a tenfold increase. By 1907 there were twenty-five systems with 659.6 miles of track according to the Wisconsin Commission's first annual report. All other forms of urban transportation had entirely disappeared. There is no doubt that the rapid development of the electric railway up to this period has not only been caused by its superior commercial possibilities over other systems, but has also been caused by the exceedingly rapid growth of population within the cities. Especially is this true when it is considered that cities usually grow to a certain size without any real need of local transportation. This size may be fixed between 5,000 and 10,000 inhabitants, depending upon physical and social conditions. But at this point and beyond, municipal intercourse demands more rapid transportation and the field is open for urban railway construction. During the last few decades many Wisconsin cities have reached this stage or exceeded it, and the commercial success of the electric railway fills a much needed want. The period since 1907 merits a more detailed discussion than that accorded to previous periods, but before giving these details it will be well to include first a brief review of the beginning of regulation.

Under the act of 1905 establishing the Commission, jur-

isdiction was given over common carriers. This law, however, did not, as later interpreted, result in uniform control over electric railways.[1] In an early case the fact was established that jurisdiction extended only over those electric railways whose lines extended beyond the corporate limits of cities, leaving those wholly within these limits, so-called street or urban railways, entirely exempt from regulation. In the annual report of the Commission dated December 1, 1906, attention was called to the construction placed upon the law in this respect by the attorney-general and by the Commission, and the suggestion was made that power to regulate should embrace either all urban railways or that such power should not extend to any urban systems. With this inconsistency before it the legislature of 1907, at the regular session, amended the section defining "railroad" to include street and interurban railways.[2] From this time, then, 1907, effective regulation began.

One of the first important acts the Commission undertook was the promulgation of a uniform system of accounting. The text issued July 1, 1909, conformed quite closely to that prescribed by the Interstate Commerce Commission. Special effort was made to secure similarity wherever possible, but in a number of instances it was found that changes were necessary. Greater detail and differences in the power accounts were required to facilitate cost analysis in rate and service cases. The power accounts were so arranged as to produce uniformity for all joint utility operation, thus avoiding unnecessary accounts and entries on the part of the utilities. In the preparation of the classifications, conferences were had with the accounting committee of the Wisconsin Street and Interurban Railway

[1] *In re* Application of Chapter 362, Laws of 1905, to Certain Street Railways, 1906, 1 W. R. C. R., 178.

[2] Sec. 1797-2, Wisconsin Statutes, 1913.

Association and with officers of the association and of individual railway systems.

Due to the differences in operating conditions, however, experience up to 1912 indicated that certain accounts should be separated as to urban, suburban and interurban operations whenever one company conducted any combination of these three services. Accurate accounts and source data could not be obtained otherwise. Accordingly, a supplementary report to produce these separations was issued for the fiscal year ending June 30, 1913, and this supplement was made a permanent part of the report for 1914. On the whole, returns have been satisfactory, each year showing greater improvements over its predecessor. Nevertheless there is still room for betterment, especially in reporting primary account separations, traffic statistics, units of operation, and detailed construction charges. To this end all possible assistance has been rendered through members of the statistical staff.

The problems coming before the Commission to regulate service are complicated and technical. To meet the extreme demands for transportation during the morning and evening rush hours in urban operation requires patient and detailed study of traffic data and routing. The public often does not realize how much time is required in certain cases to find the solution most equitable to all parties concerned. Service must be adequate for patrons and still within the reasonable limits of the company's financial ability. The standard set must usually be so flexible as to meet the requirements of rush and non-rush periods, of joint urban, suburban and interurban service, of weekly and seasonal variations in demand. In interurban service a mooted question is the extra service required during the summer months. Pleasure resorts along a line cause considerable congestion of lines, especially on Saturdays, Sundays and holidays. The running of limited and local service over the

same interurban line invariably raises the question of adequacy of local service and the limitation of scheduled interurban stops. These and similar situations are matters requiring extensive investigation. In order to give testimony of the Commission's work in the matter of service, the following general account of cases is submitted, indicating the amount and variety of decisions rendered.

Schedules.—In this matter a large improvement has resulted from the orders of the Commission on the lines of various companies by providing more rapid and adequate service through frequency of cars and adjusting the car traffic to the variations in the passenger traffic. Route and destination signs on cars have been found faulty and corrected—to the great convenience of the public. In one case a company had refused to operate its cars after 11:30 P. M., thus inconveniencing a large number of patrons who remained at social or other functions until 12 o'clock. Service was provided by the Commission until 12:20 from the central part of the city without increasing the expense of the company very materially. One of the problems which has occupied a great deal of time and skill recently was the work required to determine a proper standard of car loading as a regulator of schedules under nearly all ordinary conditions of traffic.

Crossings.—Over one thousand highway crossings exist in this state in conjunction with electric railways, of which about fifty are protected at present. Within the last two years upwards of twenty decisions have been rendered ordering the protection of electric railway crossings with steam roads and highways. In some cases two or more highway intersections were affected in one order. Among the methods ordered for protecting the public at these crossings may be mentioned the automatic bell and illuminated sign for night indication, separation of grades, removing obstructions to the view, such as trees, banks of

earth, wood wing fences to be replaced by wire fences, grading of approaches, removing entirely grade intersections with sharp or acute angles and replacing them, if possible, by right-angled intersections. The ordering of safety appliances at steam crossings, where street or interurban railways operate, has added considerably to the safety of service of these electric roads.

Interlocking Plants.—On October 8, 1913, the Commission adopted rules governing the construction, maintenance and operation of interlocking plants. By these rules a practical unification of signals has been obtained with Illinois, Minnesota and Indiana. The requirements are that plans for construction, reconstruction and rehabilitation must be submitted to the Commission for approval. The semaphore type of signal has been adopted as a general standard. No interlocking plant is to be removed without notification. Interlocking report blanks are required monthly and quarterly showing the condition of the entire plant, tests made, what failures have occurred in any apparatus during the period and the attendant causes, and how many derailments have taken place.

Cars.—On four electric lines the Commission has regulated the adequacy of car service as regards heating, ventilation, loading, size, front and rear exits, general maintenance, cleaning, and brake operation.

Stops.—In a half-dozen decisions relief has been granted to electric railway patrons by ordering companies to stop their cars at places where they either refused to do so or had abandoned former stops.

Stations.—Improvements were ordered in two stations to afford better accommodations to the public.

Bridges.—A statute of 1911 gives the Commission authority over the maintenance, renewals and construction of bridges used jointly for highway and electric railway purposes. Detailed and careful investigations of the causes

of bridge accidents have been undertaken to determine structural or operating defects. To prevent corrosion, cleaning and painting methods have been extensively investigated and advice is given to local officials, city engineers and others who have in many instances requested assistance. Pavements upon bridges have also received attention in order that aid can be given when necessary. In a recent decision under this statute a company was required to replace a dangerous bridge by a new structure and the cost was assessed to the municipality and street railway company in proper proportions.[1] Thus was a long-standing municipal controversy closed.

Track Extension and Abandonment.—It seems that no specific authority is vested in the Commission to compel the extensions of track to outlying districts near cities or to allow the abandonment of service upon tracks already in operation, if the company wishes to do so. The municipality in the matter of track abandonment, it appears, has exclusive control. In one decision[2] it was shown that neither the municipality nor the Commission had been given power by the legislature to compel track extension. Unless provided by contract or statute no extension could be demanded. In another case[3] it was held, after quoting court decisions, that a company cannot be compelled to operate a non-paying line, if the city system as a whole is earning less than a fair return. Nevertheless, the Commission has made extensive formal investigations in various cities and submitted recommendations as to the necessity of track extension or the advisability of abandonment whenever municipal officials requested such assistance or

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[1] *In re West Algoma Street Bridge in Oshkosh*, 1912, 8 W. R. C. R., 441; *also* 9 W. R. C. R., 357.

[2] *Merrill* v. *Merrill Railway & Lt. Co.*, 1910, 5 W. R. C. R., 418.

[3] *Brown* v. *Janesville Street Railway Co.*, 1910, 4 W. R. C. R., 757.

the situation arose in connection with a formal case or with other matters. Aside from the questions referred to, it may be stated that orders have been issued compelling the construction of double track or sidings on interurban and urban lines[1] when these were essential to the rendition of adequate transportation service.

Miscellaneous.—Orders of a miscellaneous character have been issued from time to time which have improved electric railway service. Crosstown lines and a through route were ordered in instances to give certain persons a more direct route between their residences and their daily work. In another case service to an important public park was ordered resumed after it had been abandoned by the company; noisy operation on a curve was abolished in one case by requiring either reconstruction or proper maintenance; and a definition was placed upon hand luggage with the provision that a ruling of the company requiring baby carriages to be wrapped before allowing them upon the cars was unreasonable.[2]

Rates.—One of the common sources of complaints is the five-cent zone fare as applied to suburban and interurban traffic. No less than fifteen formal complaints and numerous informal complaints have been received by the Commission in regard to this system of fares. The chief cause for dissatisfaction is the flat charge of five cents within the zone regardless of the respective length of the zone or the length of passenger haul within the zone. Special ticket fares and overlapping zones have been established by companies to overcome the inequalities, but these measures have usually aggravated the situation, resulting in greater discrimination. It has been found necessary in order to establish equality or minimize inequalities in rates to abol-

[1] *Buergin, Jr. et al.* v. *Southern Wisconsin Ry. Co.*, 1913, 11 W. R. C. R., 762.

[2] *Martin* v. *Southern Wisconsin Ry. Co.*, 1911, 8 W. R. C. R., 311.

ish this zone system on suburban and interurban lines and replace it by either a copper zone or a mileage system, according to the circumstances. Two interurban companies in this state operated under the latter systems voluntarily before regulation of electric railways began, and only one complaint has been filed during the regulatory period which attacked the competitive feature of the rates charged by one of these companies. On the whole, the copper zone and mileage basis have been found far more satisfactory from the standpoint of equality between patrons than the five-cent zone. Accordingly, wherever it has been found feasible, a change in rates has been ordered or recommended in meeting complaints against the nickel-zone system. In other cases the five-cent zones have been so rearranged as to eliminate the grossest discriminations. Since 1907 two companies have adopted the copper basis for rates while several are about to change over. More than 50 per cent of the track mileage is now operating upon the small zone or mileage basis.

Another matter in which the patrons of suburban and interurban lines have been benefited by decisions is evidenced by the orders covering ticket fares. Such companies sell reduced fares in blocks of tickets but claim that it is impractical to sell them upon the cars on the contention that the conductor is unable to attend to the platform duties properly and handle tickets at the same time. Companies, therefore, sell tickets at their offices only or at several additional places. Under such conditions these reduced fares are usually available to but a few patrons who are conveniently located, and the large majority must go to considerable inconveniences to procure these tickets. Whenever it seemed reasonable the Commission has required these tickets to be sold upon the cars so as to be available to all who desired to buy.

With respect to urban fares two reductions have been

ordered.[1] The reduced ticket rate of thirteen for fifty cents ordered in Milwaukee has been appealed to the courts. The Supreme Court of Wisconsin and that of the United States have upheld the legality of the reduction upon the basis of the appeal.[2] In Superior a reduced fare of six tickets for twenty-five cents established by the Commission on November 13, 1912, has been declared reasonable by the Circuit Court of Dane County and affirmed by the Supreme Court, June 1, 1915. In urban centers, whenever it has been practicable and not open to abuse, the fares have been supplemented by single or double transfers, to relieve the patrons of paying two fares. In Milwaukee double transfers were provided on a crosstown line, while within the city limits of Neenah the two companies —Wisconsin Electric Railway Company and Wisconsin Light, Heat and Power Company—were compelled to establish a single fare through transfer in place of the former double five-cent fare.

Whenever a new line is contemplated, the Commission, under the laws governing certificates of convenience and necessity, prevents duplication and the resulting ruinous competition by making a careful survey of the proposed construction, the density of population to be served, and other traffic factors.

In many informal proceedings the Commission is helpful whenever it deems it advisable. In accounting or engineering, for instance, assistance is rendered daily through correspondence, or in person, by members of the staff working in the field. No definite record exists of such aid, but it is not overdrawing the situation to state that a

[1] *Milwaukee* v. *Milwaukee Electric Ry. & Lt. Co.*, 1912, 10 W. R. C. R., 1-305; *Superior Commercial Club et al.* v. *Duluth Street Ry. Co.*, 1912, 11 W. R. C. R., 1-31.

[2] *Milwaukee Electric Railway & Light Co.* v. *Railroad Commission of Wisconsin*, 142 N. W. Rep., 491. (Sustained by U. S. Supreme Court, June 14, 1915.)

considerable part of the Commission's work is taken up by these informal matters.

In addition it should be stated that the recent decisions in the express cases have reduced rates upon these interurban lines engaged in express business.

And finally, the law passed in 1913 is of importance. It provides for the municipal acquisition of any electric railway. Under this law the Commission within three months after receiving notice fixes the compensation to the electric railway for which title may pass to the municipality. Thus far no municipal purchase case of an electric railway has arisen.

CHAPTER XII

ELECTRIC, GAS AND HEATING UTILITIES

The effective application of the Public Utility Law to the control of rates and service of gas and electric companies took place almost immediately upon the enactment of the law. It should not be inferred that any hesitation was evinced by the Commission in applying the terms of the law to the other classes of utilities. The circumstances, however, were such that the groundwork for regulating the gas and electric business could be more quickly laid and the results were sooner apparent.

A mandatory provision of the law directed that the Commission should ascertain and fix suitable standards for the supply of service. This was in accordance with the general policy of this legislation looking toward the betterment of public service conditions as expressed by the whole act. The provisions of this feature of the law and its practical administration have already been explained.[1] Following the establishment of service standards which were formally issued[2] July 24, 1908, the service department of the Commission commenced operations. The state was divided into districts and an inspector appointed for each district so created. This inspector makes periodic visits to each utility, traveling on an unannounced schedule. The inspection of gas and electric plants has become

[1] Ch. V.

[2] *In re Standards for Gas and Electric Service in the State of Wisconsin*, 1908, 2 W. R. C. R., 632; these standards were revised Aug. 9, 1913, 12 W. R. C. R., 418.

less burdensome as the utility operators learn the effect of good service upon revenues. The number of inspections per year for each plant has been reduced in late years. Gas plants are seldom visited more than twice, while the majority of the electric plants receive but one visit. Utilities rendering poor service are watched with more care than those of good record. The size of the city also determines in part the frequence of inspections.

In order to meet fully the demands of the public as well as the law many electric plants have been rehabilitated. In other cases the period of operation has been lengthened. This is more particularly true of the smaller cities, listed in classes C and D, located in towns of from 600 to 3,000 population. Action on the part of the utilities to this effect has sometimes been voluntary, but more often stimulated by a suggestion or order of the Commission. Among those smaller cities where the operating period has been lengthened recently may be mentioned Omro and Mondovi. The extension of the lines of the large systems into the country districts has resulted in more uniform and cheaper service. Gas plants have raised the standard of their product to the required mark wherever necessary, although it may be said that the first calorimetric tests in 1908 showed but few cities in which the gas produced was below 600 British thermal units. The greatest improvement has been in making the pressure equal and uniform.

In so far as heating standards of service are concerned, no formal rules have been issued. Only ten cities of the state receive general heating service. The practices of these utilities are under the inspection and control of the Commission.

The provisions of the law with reference to the making of rates for gas, electric and heating utilities are the same as those for other utility service. After the enactment of the law the utilities were instructed to file with the Com-

mission all schedules effective April 1, 1907, for service within the state. The response received from the utilities was not satisfactory and accordingly blank forms were prepared in September, 1907, for use in filing the rates. This procedure elicited a fuller reply both as regards the number of schedules filed and the completeness of the classification of rates. In 1912, the rate schedules effective June 1, 1912, were compiled by the Commission's statistical department and published so that now the rates of all concerns supplying utility service may be examined and compared without delving into the maze of original records.

The filing of rates revealed that considerable diversity existed in the method of charging for electric, gas and heating service. The greatest variety is probably to be noted for electric service. Among the various forms of electric schedules, the following may be mentioned as indicative of what is true to a marked degree in the case of all classes of utilities:

1. *Flat Rates per Lamp.*—Under this schedule all the customers in any class pay the same amount regardless of the amount of current consumed. These companies sometimes endeavor to establish classifications in which the period of use is limited, one rate applying to use of lamps until 10 P. M., another until 12 P. M., and another for all-night service. These limitations are difficult of enforcement. The schedule usually leads to waste of service and inequality in the charges.

2. *Uniform or Straight Line Meter Rate.*—All consumers pay the same rate per kilowatt hour under this schedule regardless of the total quantity of electrical energy consumed.

3. *Regressive or Step Meter Rate.*—This schedule may consist of a uniform rate per kilowatt hour with a "step" system of discounts which results in a regression of the charge at certain points of the schedule. In other words,

this method of charging is found to be faulty because at certain points of the schedule it is possible to *reduce the total charge by increasing the quantity of current consumed.*

The schedule may also consist of "step" rates without the discounts.

4. *Increment or Block Meter Rate.*—This schedule may be made of a uniform meter rate with discounts applying to "blocks" of energy, or of varying meter rates applicable to "blocks" of energy. By "block" is meant a predetermined number of kilowatt hours representing a portion of the total monthly consumption. This method avoids the regression in the charges noted in the preceding schedule.

5. *Demand or Readiness-to-Serve Rates.*—

(a) Flat demand rate. The charge is based upon only the demand of consumer; the amount of energy used is not considered. The demand may be measured, estimated or based on the connected capacity of the equipment.

(b) Wright demand rate. This rate consists of two or more charges applicable to "blocks" of energy. In this case, the "blocks" vary with a predetermined length of use of the maximum demand. The maximum demand may be measured, estimated, or assessed as a percentage of the connected load. The number of kilowatt hours in each block is determined by multiplying the maximum demand by the number of hours monthly which has been fixed upon. The bill is found by multiplying the kilowatt hours in each "block" of energy by the respective rates.

(c) Hopkinson demand rate. Two charges are made: one as for "a" is based on the demand and the other is based on the amount of energy used.

(d) Hopkinson block demand rate. This is similar

to "b" except that the energy charge may be determined on a block system as in the case of the regular increment rate (4).

(e) Three charge demand rate. In this system of rates there is a charge per consumer or meter and demand and energy charges as in "b" and "c" above.

Not only are all of these forms of schedules in use, but a utility may have several of the schedules in force simultaneously for different classes of service or as optional schedules for the same service. This situation complicates the matter of classifying and comparing rates and charges and of determining the effect of proposed amendments upon consumer's bills. The following comment on the circumstances existent in 1907 and 1908 is quoted from the Commission's annual report:

> The rates filed by the larger companies are generally based [1] upon scientific considerations, but those of the smaller companies partake of every conceivable form and method of determination. They vary from the simple schedule of but two or three lines to the most elaborate classification of consumers. In a majority of instances there appears to have been no particular system followed in determining the amount to be charged for a given service. The process of reasoning, which in some cities placed certain classes of consumers upon meter rates or upon flat rates, seems to have been exactly reversed in other cities. Rates for similar service often vary several hundred per cent in neighboring cities. In a number of instances schedules are in force which make some concession in rates with increasing consumption, but the rates have seldom been determined with regard to the cost of service. Too frequently the tendency is noticed to copy the rate schedule of another community with the result that many inconsistencies in charges are passed from city to city. The majority of schedules on file, in the effect of their application, are not calculated to secure the greatest development of service with the consequent reduction in the unit costs.

[1] Annual Report Wisconsin Railroad Commission, 1908, 41.

Not only were the rate schedules incongruous, but wide discriminations were practiced.[1] For example, in one village of 1,400 inhabitants, the electric company granted special rates to forty-two out of a total of ninety-nine consumers. The amounts which those forty-two favored consumers actually paid, and the corresponding schedule charge for each, are diagrammed in Fig. 1 below.

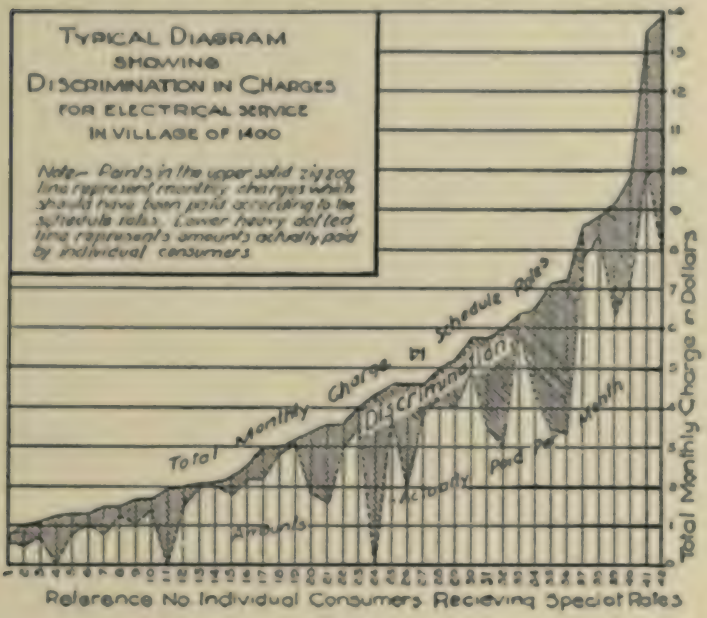
TYPICAL DIAGRAM
SHOWING
DISCRIMINATION IN CHARGES
FOR ELECTRICAL SERVICE
IN VILLAGE OF 1400
Note— Points in the upper solid zig zag line represent monthly charges which should have been paid according to the schedule rates. Lower heavy dotted line represents amounts actually paid by individual consumers
Total Monthly Charge by Schedule Rates
Discrimination
Actually Paid per Month
Amounts
Total Monthly Charge in Dollars
Reference No Individual Consumers Recieving Special Rates

Fig. 1.

These graphic charts are taken from the 1908 annual report of the Railroad Commission of Wisconsin.

By way of explaining the above diagram an illustration may be taken. Consumer No. 36 was paying about $3.40 per

[1] For statistics on discriminations practiced by utilities before public utility regulation in Wisconsin, *see* Report of Railroad Commission, 1908, 49-71.

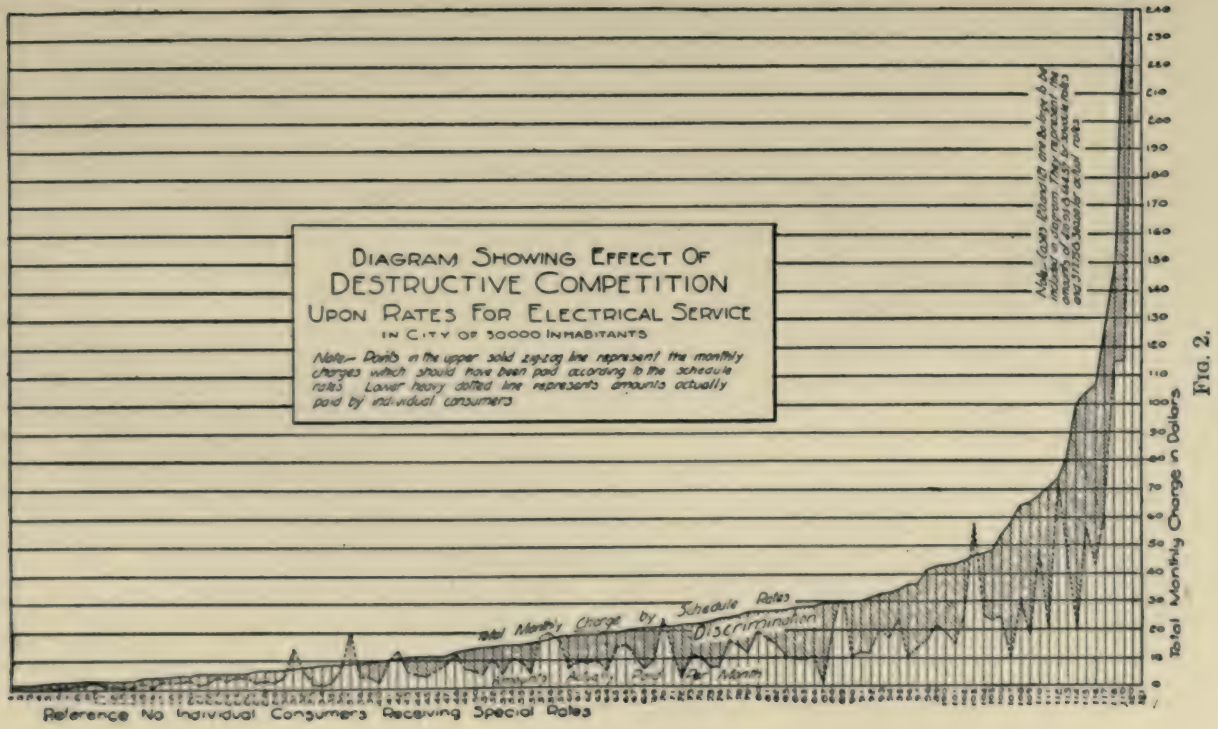
DIAGRAM SHOWING EFFECT OF
DESTRUCTIVE COMPETITION
UPON RATES FOR ELECTRICAL SERVICE
IN CITY OF 30000 INHABITANTS
Note— Points in the upper solid zigzag line represent the monthly charges which should have been paid according to the schedule rates. Lower heavy dotted line represents amounts actually paid by individual consumers
Total Monthly Charge by Schedule Rates
Discrimination
Total Monthly Charge in Dollars
Reference No Individual Consumers Receiving Special Rates

FIG. 2.

month, while according to schedule he should have paid about $7.20. The margin between the dotted and heavy lines represents the discrimination, equivalent to a rebate of $3.80. Equally striking illustrations of discriminations, due to competitive conditions, were practiced in another city of 30,000 inhabitants. Out of 2,390 consumers discriminatory rates were granted to 121, which amounted to an average monthly rebate of $1.942. In Fig. 2 are shown in graphic form the 121 cases above referred to, which include eight cases where consumers were actually charged more than the schedule rates in effect.

Through the system of state regulation practically all discriminations have disappeared. In the making of new rates for these utilities the Wright demand rate seems to have met with the most favor of the Commission for electric lighting service and the Hopkinson demand rate for power service. Recently, however, modifications of the Hopkinson schedule have been instituted by the Commission through the establishment of maximum lighting rates on the one hand and minimum charges on the other.

For gas service the Commission has generally adopted a "block" system of rates. No important changes have been made in the rates which have been in force for heating service; but calculations which the Commission has set forth in some cases in which heating service was dealt with incidentally, indicate that some form of demand rate may eventually meet with the Commission's approval.

Although a single form of rate schedule for electric service has not always been adhered to by the Wisconsin Railroad Commission, nevertheless certain fundamental principles have been followed and underlie the rates even when peculiar circumstances in the case require some departure from the form of schedule which the Commission appears to prefer. The method pursued by the Commission in determining rates for an electric utility was fully

described by Commissioner Erickson in an address on "Making Rates for Electrical Plants," delivered before the Ohio Electrical Convention at Cedar Point, Ohio, July 17, 1914. The following is quoted from the Commissioner's address:

To make a rate schedule that is just, not only as between the different departments in the service, but between the individual customers in each department, is no easier than it is to determine the total revenue to which the utility is entitled. It means a close investigation, not only of all expense items and other operating data, but of the conditions under which the plant is operating, and the nature of the electricity business in its various phases. In other words, it means that the various expense items must be classified under demand and output costs,[1] the factors to which, in a general way, the responsibility for the expenses can be traced. It means further that the demand and output costs must, in turn, be apportioned between the different departments of the service, and that methods must be developed under which these costs for each department can be fairly distributed among its customers and under which such costs per unit may be computed as are needed in determining upon proper rate schedules.

The main reasons for the necessity of thus apportioning the total cost between demand and output expense is found in the difference that exists in the nature of these two classes of costs. The *demand* costs, for instance, depend very largely upon the maximum demand on the station at the time of the peak load. They are independent of the output, or of the amount of current generated. The *output* costs, on the other hand, depend largely upon the amount of current generated or sold, and vary therewith. They are independent of the demand on the station. Since

[1] Leading cases in the apportionment of electric expenses: *In re Application Stoughton Municipal El. Lt. System*, 1909, 3 W. R. C. R., 490; *In re Menominee & Marinette Lt. & Tr. Co.*, 1909, 3 W. R. C. R., 831. Gas Utility Apportionments: *State Journal Printing Co. et al.* v. *Madison Gas & Electric Co.*, 1910, 4 W. R. C. R., 735, 737; *City of Racine* v. *Racine Gas Light Co.*, 1911, 6 W. R. C. R., 141; *City of Beloit* v. *Beloit Water, Gas & Electric Co.*, 1911, 7 W. R. C. R., 187.

the demand costs depend on the maximum demand, they should also be distributed on the demand. Likewise, since the output expenses depend on the output of current, they should be distributed upon this output.

The effect of these rules may be illustrated. For a plant having a total yearly demand cost of, say, $154,000, and a maximum demand at the time of the peak load of, say, 3,850 kilowatts, the yearly demand cost per kilowatt would be $40. This cost would remain about the same whether the plant was in operation one hour daily, and thus turned out one kilowatt hour per day for each kilowatt demanded, or whether it was in operation five hours daily or more and turned out five kilowatt hours of current daily for each kilowatt demanded. In other words, the demand or capacity cost per kilowatt is about the same when the fixtures are used one hour per day as when they are used five or more hours per day, but when the demand cost per kilowatt is distributed over the hours of the daily use of the fixtures or installation the situation is different. In this case the demand cost per hour, or kilowatt hour, under the above figures, would be eleven cents for the one-hour users, while for the five-hour users it would amount to only about 2.20 cents.

These variations in the demand cost, with variations in the hours of daily use of the fixtures or plant, also greatly affect the total unit cost; that is, the unit cost when it includes both the demand and the output expense. For instance, if the above plant had an output cost of $62,000 per year and sells about 3,900,000 kilowatt hours of current, the output cost per kilowatt hour sold will be about 1.60 cents per kilowatt hour. This cost, as stated, remains about the same per kilowatt hour, regardless of the time of operation. When this output is added to the demand costs it is found that the total cost per kilowatt hour is about 12.6 cents for those who use their fixtures one hour per day and about 3.8 cents for those who use their fixtures or current five hours daily.

The figures thus given are not absolute, but they are nearly enough so, to show the importance of the demand factor in rate-making. In fact, the effect of the demand upon the costs is such that it would seem that few rate schedules can very well be equitable in which this has not been taken into consideration.

This is also likely to remain true until some means have been discovered by which current can be successfully and cheaply stored, so that the peak demand can be supplied from that source, and the capacity and investment of the plant can be adjusted to the average load rather than to the peak load.

The necessity for apportioning the total demand cost between the departments arises from the fact that some departments are

TABLE SHOWING COST PER UNIT DECREASES WITH THE INCREASING USE OF ELECTRIC SERVICE

Number of hours during which the consumer's load is used daily or the number of kilowatt hours used daily per kilowatt of active load	Demand cost per kilowatt per day	Output cost at 1.6 cts. per kilowatt hour	Total cost	Total cost per kilowatt hour
	cts.	cts.	cts.	cts.
1	11.0	1.6	12.6	12.60
2	11.0	3.2	14.2	7.10
3	11.0	4.8	15.8	5.27
4	11.0	6.4	17.4	4.35
5	11.0	8.0	19.0	3.80
6	11.0	9.6	20.6	3.43
7	11.0	11.2	22.2	3.17
8	11.0	12.8	23.8	2.98
9	11.0	14.4	25.4	2.83
10	11.0	16.0	27.0	2.70
15	11.0	24.0	35.0	2.33
20	11.0	32.0	43.0	2.15
24	11.0	38.4	49.4	2.06

responsible for greater demand charges than others, and that, within certain limits at least, it is proper that these differences should be recognized in the rates. Incandescent lighting, for instance, is a peak load, short-hour business, with a high demand and consequently high demand cost. Power, on the other hand, may be largely an off-peak long-hour business, with a relatively low demand and therefore low demand cost. Not to consider such differences of costs in rate-making would seem unfair, as well as poor business policy.

Some departments also have a relatively lower output cost

than others. This is mainly due to differences in the length and costs of the distribution systems and of a few other items that belong to specific departments. While these differences in the output costs may not be great, they often amount to enough so as to require detailed separations of the output cost as between the departments.

In apportioning the cost, as between demand and output expenses, those items which come directly in one class or the other are placed where they belong. Those items, on the other hand, which are indirect or common to all classes, are more difficult to deal with. Such items must be apportioned partly in proportion to the direct items upon which they may depend and partly on the operating unit to which they bear the closest relations. . . .

The demand and output costs, when thus determined, must, as stated, be apportioned among the different departments of the service. These departments usually consist of the incandescent lighting, street lighting and power. Owing to variations in the demand or active load, as between different classes of consumers in the incandescent department, it is also as a rule necessary to divide the costs for this department among these classes. This division, however, is usually effected through adjustments of the active load. . . .

The term "active connected load" would seem to require explanation. By this term is usually meant such proportion of the connected load for each department, class, and individual customer, as has, in each case, been found proper upon investigation. The active load, when carefully determined and applied, would seem to be as equitable, convenient and practicable a basis for apportionments and charges as any method that can be used for this purpose. One reason why it meets the requirements is, that in any given city there is considerable uniformity in the use which given classes of customers make of their installations. That this is actually the case has been established by extensive and careful examinations of numerous customers' records, demand meters and other facts. Thus it has been found that for several cities, which resemble each other in size, kind of users, and type generally, the proportion of active to connected load varies from forty to fifty per cent for residences, from fifty to eighty per cent for

stores of various kinds and between other limits for other classes. Consumers who make about the same use of their fixtures can also, as a rule, be safely placed in the same class with respect to their active load. This conclusion is based upon considerable experience in the matter. The check that is afforded in this respect by the ordinary wattmeter is also a factor. . . .

When the unit costs for each department of the service, and the active load for each class of customers in each of these departments, have been determined, when rate schedules have been made up therefrom, then it becomes necessary to also find some method for computing the monthly bills of the customers under which both the demand and the output costs are fairly distributed. There are, of course, more ways than one in which this can be done. Under the method of rate-making here outlined, however, the best way is to compute it on the basis of the hours of use of the active load, as fixed in the rate schedule for the various classes.

The method of rate-making that has been outlined herein, differs from the so-called "readiness-to-serve" method mostly in the way the demand costs are treated. Under the latter method, the total demand cost is determined in about the same manner as that described herein, but the rate schedules are mostly made up of a so-called service charge covering all, or a part of the demand cost, and of a meter charge covering the balance of the expenses. This method would seem to be even more logical, as well as more convenient, than the method here described, but its adoption is often impracticable because of objections to it by many incandescent customers, who seem to think that the service charge represents something else than a part of the necessary cost of the service.

When it comes to the power service, however, these objections to the "readiness to serve" method do not seem to exist, and to this service, therefore, this method may be applied. . . .

Proper treatment of the demand factor and for the costs for which it is responsible is also of the greatest importance, because of its effect upon the development of the business of the plant. Experience has demonstrated that rate schedules, based on cost curves, have, with very few exceptions, proved to be the best

possible business developers. They not only attract new business but they encourage additional uses for existing installations. They do this because they are adjusted to the situation in this field, and because they recognize the fact that such additional use of the fixtures is not accompanied by material increases in the demand costs. Any method of which all this can be said is of as great a value in the utility field as in the industrial field generally.

The table on page 180 shows that the decreasing cost of electric service is applicable to the entire business of the company whose business was discussed, but in order to illustrate how the Commission arrives at a rate for lighting service we may assume that this table applies only to the lighting portion of the business. It will be noticed that for one hour's daily use of the load the cost is 12.6 cents per kilowatt hour, from which it runs down to about 2 cents per kilowatt hour, when the load is in use twenty-four hours. Various combinations of charges on the Wright demand system of rates could be selected but judgment must be exercised regarding what steps will conform most closely to the variation in the cost while giving consideration to the reasonable maximum charge and to the benefits growing from development of the business. In this particular case the investigator may conclude that the rate should be 12 cents for the first hour's daily use, or the first 30 hours' monthly use of the active load; 6 cents for the next 60 hours' use of the active load and 2 cents for all current consumed in excess of 90 hours' use of the active load. The following table shows the variation in the average charge to any consumer when using current under this schedule.

The customer's bill would be computed in the following manner. The total rated capacity of the load of the customer's lamps would be ascertained and recorded on the books of the company. The active load would be deter-

Hours' use of active load daily	Average rate per kilowatt hour—cents
1	12.0
2	9.0
3	8.0
4	6.5
5	5.6
6	5.0
7	4.6
8	4.2

mined by calculation. Let us assume that in the classification of consumers the rate-maker has concluded that for residences 60 per cent of the first 500 watts connected for lighting purposes shall be deemed active and everything in excess of 500 watts, 33⅓ per cent active. Then the active load for a residence with a total of 1,100 watts connected would be 700 watts. Thirty hours' use of the active load is 21 kilowatt hours, and this customer would have to pay the highest, or primary rate, for all current up to and including 21 hours. Sixty hours' use of the active load is equivalent to 42 kilowatt hours. The consumer would have to pay the secondary rate, or six cents for current consumed between 21 and 63 hours. All use above 63 kilowatt hours would be charged for at the excess or 2-cent rate. Suppose the consumer with an active load of 700 watts used 100 kilowatt hours per month. The bill would then be as follows:

21 kilowatt hours at 12 cts	$2.52
42 kilowatt hours at 6 cts	2.52
37 kilowatt hours at 2 cts	.74
Total	$5.78

The effect of the Wright demand rate is to cause the customer's average rate to vary according to the relation of the current consumed and the active load.

MAKING OF GAS RATES

In the gas business, similar elements of cost are to be found but the rate-maker does not have at his disposal any practical method of ascertaining and classifying consumer's demands. Fortunately, however, the element of demand does not exert so strong an influence on the cost of production in the gas business as in most of the other classes of utility service because the employment of large gas-holders makes it possible to store gas against the coincident peak demands of the consumers. But since many of the expenses are found to bear some close relation to the number of consumers, a uniform rate even for gas service does not appear to lead to an equitable distribution of the expense burden. It is interesting to note how the tables of decreasing cost and the block schedules are derived by the Commission.

We shall take for an example a gas plant whose total annual sales are 60,000,000 cubic feet of gas, and number of customers served, 3,000. The annual expense of carrying on the business of this plant, including the fixed charges as well as current operating expenses, amount to $60,000, of which 25 per cent, or $15,000, is found to bear a close relation to the number of customers supplied, while the remaining 75 per cent, or $45,000, is more closely related to the actual volume of business. This is a typical case as applied to the gas industry.

The number of bills that must be rendered annually at the rate of one each month for each customer is 36,000; and since the consumer expense is very largely an expense that all consumers are responsible for and should bear equally, according to the cost of service theory, the number of bills or "consumer months" may be divided into the expense to ascertain this monthly amount that each consumer should bear even when no gas has been used. In

this instance it is found that the consumer expense amounts to approximately 42 cents per consumer per month. The balance of the expense, which may be termed the "output" cost, is $45,000 and is equivalent to 75 cents per 1,000 cubic feet of gas sold. This is what each consumer should pay for each 1,000 cubic feet in addition to the consumer expense. Consequently, if a consumer uses 1,000 cubic feet of gas in one month, the total cost of that gas will be $1.17. If, however, 2,000 cubic feet of gas be used, the cost will be still further increased by 75 cents, making the total bill $1.92, or a cost per 1,000 cubic feet of 96 cents. This decreasing cost may be more clearly illustrated by putting the figures in tabular form.

TABLE OF DECREASING COST OF GAS

Cubic feet per month	Consumer cost	Output cost	Total cost	Total cost per 1,000 cubic feet
1,000	$0.42	$0.75	$1.17	$1.170
2,000	.42	1.50	1.92	.960
3,000	.42	2.25	2.67	.890
4,000	.42	3.00	3.42	.850
5,000	.42	3.75	4.17	.834
10,000	.42	7.50	7.92	.792
25,000	.42	18.75	19.17	.766
50,000	.42	37.50	37.92	.758

The block schedule of rates may now be fixed upon, and the resultant charges may be made to conform to a reasonable degree with the variation of cost shown by the following table. As in the case of electric business, the rate schedule to be adopted will be influenced by many circumstances, but the cost analysis is the framework upon which the schedule may be constructed. In the case of the particular circumstances set forth here it appears that the rate should be as follows:

First...	1,000 cubic feet per month,	$1.10 per 1,000 cubic feet
Next...	4,000 cubic feet per month,	1.00 per 1,000 cubic feet
Next...	5,000 cubic feet per month,	.75 per 1,000 cubic feet
All over	10,000 cubic feet per month,	.70 per 1,000 cubic feet

The effect of this schedule upon the average charge to the consumers is shown by the following table:

AVERAGE GAS RATE CURVE

Amount used monthly	Average charge per 1,000 cubic feet
1,000	$1.10
2,000	1.05
3,000	1.03
4,000	1.02
5,000	1.02
6,000	.975
7,000	.940
8,000	.920
9,000	.900
10,000	.875
12,000	.835
20,000	.742
30,000	.695
50,000	.659

One of the conditions necessary for the determination of equitable rates was furnished by the legislature when it provided by law that all utilities should report annually to the Commission the details of their business. In 1908 there were 230 electric, 52 gas and 13 heating utilities. Under the jurisdiction of the Commission, the number increased to 257 electric, 52 gas and 14 heating utilities in 1913. Year by year the reports of these utilities have been studied and analyzed; their revenues, expenses, investment and other operating data have been reduced to units and sorted into groups. The information has become public

information through the Commission's publications. Anyone may now ascertain the circumstances surrounding the operation of any utility in the state and its relative standing with other similar concerns by examination of the statistical standards determined annually by the Commission. The framers of the law early foresaw the necessity of a uniform classification of accounts, for of little value to the public or the regulative body would be all the statistical comparisons, if no uniformity existed in the classification of earnings and expenses. As it is, however, the statistical data serve an important part in fixing rates.

Close investigation must usually be made into the operation of each utility whose rates are before the Commission for consideration, for public utilities, like individuals, have their peculiar environments and life history which must be considered in the proper diagnosis of the case. But comparisons which established standards of revenue, expense, volume of business and similar data, often reveal at a glance abnormal conditions which otherwise might require weeks of careful study to discover. Some conception of this may be learned from statistical comparisons of the electric and gas business, illustrated by figures taken from the Commission's annual reports. The following table is a summary of some of the data for Class A electric utilities, numbering about 27. The minimum and maximum figures show the wide range for different utilities operating probably under different conditions; the average or median figures indicate the normal amount.

Let us see how statistical comparisons have been applied in some actual rate cases. In 1912, the rates of a certain Class A gas plant were before the Commission for investigation upon complaint of the city in which it is located. The comparison of expenses which had been made by the Commission for the preceding year showed that the total direct

SOME STATISTICS FOR CLASS A ELECTRIC UTILITIES FOR YEAR ENDING JUNE 30, 1912

	Revenue per kilowatt hour	Operating expenses* per kilowatt hour	Power generation per kilowatt hour	Meter reading and delivering bills per meter
	cts.	cts.	cts.	cts.
Minimum	0.73	0.10	0.04	10.5
Maximum	8.18	4.45	3.21	80.1
Average	3.42	1.81	1.11	32.0
Median	3.38	1.85	1.12	25.9

* Excluding depreciation, taxes and interest.

expenses, less earnings from residual products, were 80.6 cents per 1,000 cubic feet of gas sold, while the normal figures for other gas companies of the same class were 68.5 cents per 1,000 cubic feet. The discovery of this difference in the cost of carrying on the business led at once to a more complete comparison of the statistical units and it was found further that the yield of gas per pound of coal carbonized was considerably less than the normal amount; that the amount of lost and unaccounted for gas was much more than usual and that maintenance, especially of the distribution system, considerably exceeded the average cost. These matters were taken up with the company's manager, who explained that his company, which had recently acquired the gas property, had found the equipment in a run-down condition. The gas retorts in which the coal was heated to drive off the gas in the coal were in need of repairs. On this account an appreciable amount of gas was lost without even being measured by the station meter, so that the amount of gas delivered to the holders was actually less per pound of coal used than most companies were able to show.

ELECTRIC UTILITIES—CLASS A, CURRENT UNACCOUNTED FOR, YEAR ENDING JUNE 30, 1911

Location	Name of company	Total kilowatt hours made and purchased	Total kilowatt hours sold and used	Total kilowatt hours loss	Per cent loss
Appleton	W.T.L.H.& P.Co.	2,349,619	1,927,828	421,991	17.82
Beloit	B.W.G.& E.Co.	1,789,978	1,528,730	261,248	14.65
Eau Claire	C.V.R.L.&P.Co.	3,736,990	2,802,743	.....	.....
Fond du Lac	E.W.R.& P.Co.	2,964,777	2,598,253	366,524	12.32
Green Bay	G.& E.Co.	3,620,530	2,910,161	710,369	19.62
Green Bay	Hydro El. Co.	6,188,577	5,257,565	931,012	14.09
Janesville	J.E.Co.	2,410,656	1,872,227	538,429	22.19
Kenosha	G. & El.Co.	1,309,825	937,887	371,948	28.42
Kenosha	El.Ry.Co.	894,510	869,128	25,382	27.01
La Crosse	G.& El.Co.	4,816,390	4,171,910	644,480	13.35
La Crosse	W.Power Co.	7,218,800	5,732,231	1,486,569	20.26
Madison	S.Wis.P.Co.	48,948,446	46,593,654	2,354,792	4.82
Manitowoc	M.E.L.Co.	933,482	551,846	381,636	40.91
Milwaukee	Com.Pr.Co.	5,082,283	4,661,813	420,470	8.25
Milwaukee	T.M.E.R.& L.Co.	30,176,888	23,697,213	6,479,675	21.24
Milwaukee	M.L.H.& T.Co.	4,563,318	3,572,277	991,041	21.72
Milwaukee	Wells Pr.Co.	1,493,061	1,336,053	157,008	10.51
Oshkosh	O.G.L.Co.	3,326,600	2,835,555	490,945	14.41
Superior	W.L.& P.Co.	2,807,960	2,189,044	618,916	22.04
Superior	North Pr.Co.	11,158,000	10,467,672	690,328	6.19
Watertown	W.G.&E.Co.	1,202,531	939,339	263,192	21.89
Minimum		894,510	551,846	25,382	4.89
Maximum		48,948,446	46,593,654	6,479,675	40.91
Average		6,952,058	6,060,192	930,298	18.09
Median		2,964,777	2,802,743	514,687	18.72

The distribution system was in a very poor and leaky condition because the system had not been carefully maintained in the earlier days. According to the facts related by the manager, the drip pots, which are devices used in the distribution system to catch the condensation, had been made of kegs or small barrels, and because of the poor

connections resulting from such fittings, gas was blown quite freely into the air at many places.

The efforts used by the new owners to rehabilitate the system considerably increased the expenditures for maintenance during the period immediately prior to the time of the investigation. It was also found that this concern maintained no depreciation reserve but charged all renewals to expenses as a cost of maintenance. The manager agreed at a conference with a representative of the Commission that in fixing rates for his company it would be fair and proper to take into consideration the fact that the amount of gas from each pound of coal could and would be increased, that the amount lost in distributing to the consumers would be reduced, that maintenance of the system would be less when the rehabilitation had been completed, and that the cost of repairs would be reduced if renewals were taken care of by a depreciation reserve. Thus, by comparisons, the investigator had been able to place his finger upon the vital causes of the unusually high expenses without having seen the gas plant.

The effective use of the comparative data may be illustrated also by the facts brought out during the investigation of rates of another gas company concerning which the following statement was made by the Commission:

> The mileage of mains (of this company) is about 25 per cent less per 1,000 population than for other Class A gas utilities in Wisconsin, and as might be expected, we find that the number of consumers per 1,000 population is correspondingly several per cent smaller. But further comparison reveals that the number of consumers per mile of main is from 18 to 20 per cent greater than for Class A utilities and that the cost of reproduction per mile is about 23 per cent more than the average or normal amount elsewhere. These factors indicate plainly that the respondent's distribution system is, generally speaking, limited to the districts where the desire for service connection is greatest, and that the

tributary and less costly portion of the system has not been greatly extended.

The failure of the company's management to take full advantage of the business opportunities made the investment unusually high in proportion to the volume of business and for this reason it appeared proper to the Commission to allow a lower rate of return on the investment than usual until the development of the business should become more normal.

By continually auditing and comparing the statistics of the plants, profits in excess of a reasonable return are also disclosed. For example, in the case of the Madison Gas and Electric Company there have been two orders made reducing electric rates since the original investigation in 1910. Both of the latter orders were made upon the Commission's own motion as soon as the profits had exceeded a certain ratio. The annual saving to the Madison public as the result of these orders is approximately $40,000.

In fourteen gas and thirteen electric plants orders have been entered reducing rates and in eight cases substantial increases asked for by gas and electric concerns have been refused. Had there been no Commission to interfere these increases would have been made by the companies. Computing the 1913 gas and electric sales in the plants where reductions were ordered on the basis of the old rates and then comparing the totals with the results obtained under the rates fixed or recommended by the Commission, the annual public savings exceed $140,000 for electricity and over $300,000 for gas. These totals do not take into consideration the savings due to increasing the standards of the products furnished.

CHAPTER XIII

TELEPHONE UTILITIES

The work of the Commission in so far as it relates to telephone utilities was begun with the enactment of the Public Utility Law in 1907, which delegates to the Commission the power to "supervise and regulate every public utility in this state and to do all things necessary and convenient in the exercise of such power and jurisdiction." The law further defines the term "public utility" so as to include every corporation, company, individual, association of individuals, their lessees, trustees, or receivers appointed by any court whatsoever and every town, village or city that now or hereafter may own, operate, manage, or control any plant or equipment "or any part of a plant or equipment within the state, for the conveyance of telephone messages . . . to or from the public." The act also specifies that every public utility shall file at such time and in such form as the Commission shall designate, a report of its operating and financial conditions and shall also file with the Commission and keep up to date all schedules of its rates, tolls and charges.

It is thus seen that the Commission is given full regulatory supervision over practically all telephone utilities in the state.

With the passage of the law in 1907 the schedules of rates and toll charges of the various telephone companies in the state were filed with the Commission. A casual survey of the rates as they were filed disclosed the fact that there were many irregularities and discriminations

being practiced by the companies, and it soon became apparent that the problem could not be handled by correspondence alone. With a view of arriving at a full understanding of the situation, and of calling the attention of officials of the telephone companies to these matters of discrimination, a conference of telephone companies was thought desirable. Such a conference was held at Madison, March 24, 1908.

Space will not permit of a detailed discussion of the matters brought up at this conference or of the findings of the Commission in the case. However, a brief survey of the results will be given. Among the lax procedures which were indulged in most frequently were the giving of free or reduced rate service to railroads, city offices and officers, places possessed of a quasi-public character, such as general stores, telegraph offices, opera houses, express offices, electric light plants, post offices, etc., and indiscriminate free service at competitive points. It was ascertained that there were in one town some 260, in another 250, and in another 53 telephones being maintained entirely free of charge. Cases in which service was being furnished at a reduced rate to cities, corporations and persons were numerous. The reasons given by the companies for maintaining the free or reduced rate service were various. Some maintained it was necessary to give it to keep the business going; others frankly admitted that it was maintained for political reasons.

The findings of the Commission in this case pointed out to the telephone companies wherein their various discriminations were in contravention of the law, and the order in the case gave the companies a reasonable time in which to correct and readjust their schedules so as to conform to the law.[1]

[1] *In re Free and Reduced Rate Telephone Service, Rendered in the State of Wisconsin*—being an investigation by the Commission on

This was the first important step in the establishment of uniform practices and schedules for telephone companies in this state. The next step made by the Commission looked more particularly to the increasing of the efficiency of the various companies. This was done by urging the installation of up-to-date systems of accounting and by making suggestions, and sometimes orders, to the companies, relative to raising their standards of service. It has been a difficult problem to convince many of the utilities of the necessity of accurate accounting practice, especially the smaller companies. However, up to the present time many sets of books have been installed by the Commission, and the satisfaction shown by these companies, when the systems have been in operation for a time, is one indication that the Commission's work along this line is not in vain. The Commission's inspectors have been continually making tests of telephone service in connection with their work of testing the service of gas, electric and water utilities throughout the state. Many letters are sent out each year advising companies of irregularities in service, and in most cases corrections are made without recourse to formal action. Recently this Commission has adopted a set of rules for telephone service, which establish certain standards which the telephone companies of the state are to follow.[1] These rules, while forming a basis upon which to make corrections, both formally and informally, also perform the very good office of tending to standardize all telephone service throughout the state. Inasmuch as the chief provisions of these rules have already been explained in a previous chapter on service

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its own motion, 1908, 2 W. R. C. R., 521-546. Three months' time was given the companies to conform with the rules promulgated.

[1] *In re Investigation on Motion of the Commission of Standards of Telephone Service in the State of Wisconsin*, 15 W. R. C. R., No. U-339.

standards, further discussion of them will not be undertaken.[1]

The nature and extent of the service rendered by the telephone companies of Wisconsin appear clearly from the following table:

TELEPHONE UTILITIES OF WISCONSIN, EXCHANGES DOING BOTH RURAL AND URBAN BUSINESS AS OF JUNE 30, 1912

	Number of exchange systems			Total	Total number of urban phones	Total number of rural phones	Total number of phones
	Serving rural only	Serving urban only	Serving both rural and urban				
Classes A, B, C & D.	.....	29	228	257	135,845	51,333	187,178
Wisconsin Telephone Company.	.....	12	64	76	87,617	7,104	94,721
Condensed.	309	.....	.....	309	.....*	27,217	27,217
Total....	309	41	292	642	223,462	85,654	309,126

* "Condensed" class of utilities comprises those in towns of less than 500 population.

Out of a total of 642 telephone exchanges recorded here only 41 do a strictly urban business. In other words, only 6.38 per cent of the total telephone exchanges recorded above confine their operations entirely to urban communities and 92.62 per cent extend their operations beyond these limits. Considering the business done we find that in classes A, B, C and D exchanges, the division on the percentage basis is 73 urban and 27 rural. For the Wisconsin Telephone Company, as shown in the table, 93 per cent of the telephones are urban and 7 per cent are rural, while

[1] *See* Ch. V. on "Standardization of Service."

for the condensed systems practically all of the business done is rural. These conditions are not representative of Wisconsin alone, but rather are illustrative of the telephone business for all other states in general.

The principles involved in the determination of telephone rates have not been as fully developed by the Commission as in the case of other classes of utilities. The majority of telephone rate cases which that body has handled have been applications by the smaller utilities for authority to increase rates. Many of these companies grew out of small mutual or semi-mutual companies whose existing rates had been fixed under conditions of operation entirely different from those encountered in furnishing modern telephone service. In practically none of these cases had the utility, in fixing its original schedule, taken cognizance of the existence of depreciation as an element which must be finally encountered.

This, together with the cost of furnishing an improved grade of service, made the old rates inadequate, and an increase imperative, if satisfactory service were to continue.

In these cases, however, apportionments of expense, to the degree necessitated in the electric rate cases, was not found necessary and was generally impractical, because the utilities did not possess the data requisite for such an apportionment. In certain other cases, however, apportionments have been necessary. Many telephone companies operating in Wisconsin cities do switching work for rural lines which are built into the cities. In these cases very careful traffic studies have been necessary in order to enable the Commission to determine what proportion of the costs of running the business should be charged to the foreign lines.[1]

The Commission has taken the stand that each class of

[1] *Application of Farmers' Telephone Co. of Beetown to Increase Rates*, 13 W. R. C. R., 540-559.

service should, as far as possible, bear its own costs. To this end, the Commission has extended the use of message rates on toll business where flat rates formerly prevailed, although the message rate basis is by no means exclusively used as yet.

With the development of devices for recording the number of messages, as an electric meter records the use of electric current, the use of the measured service basis of charging for telephone service is becoming much broader. The extension of the principle that each user should pay for the service he receives and not be burdened with the cost incurred by other users, who may or may not be careful in their use of the service, makes the use of the meter rates a logical development in the telephone industry.

The difficult questions of division of costs among the many classes of telephone service, of determining the fixed and variable costs, and of deciding how these should be met, have not been fully worked out, but from the way in which the Commission has handled cases of other utilities, there can be no question that one of the tasks before it will be the formulation of scientifically adjusted rates.

The essential equipment of a telephone plant falls into three divisions. There must be a central office, a wire plant and equipment on subscriber's premises. Naturally operations involved in furnishing service group themselves under these three divisions. When service is furnished it becomes necessary to have a means of handling subscribers' accounts and of securing collection of bills. This forms a group of commercial expenses which is distinct in character from the expenses which are involved in *administering* the business as carried on in the central office, the wire plant, the substation and the commercial departments and which latter expense may be classified as administrative or general. Undistributed expenses include those which are

of a general nature but are not incurred for an administrative purpose.

The above primary groupings appear to coincide with the primary characteristics of the utility and it must follow that where accounts are thus classified, depicting the cost of each process, both the utility and the Commission are able to relate reported expenses directly and unquestionably to the part of the business which brought them into existence. For the purpose of a body which is seeking to carry out a policy of basing rates on costs, the same information is needed as for the cost accountant who seeks to know the efficiency of each department of the business.

PHYSICAL CONNECTION LAW

In 1911 the Public Utility Law was amended providing for physical connection between telephone companies. The statute as amended reads[1] as follows:

1. . . . every utility for the conveyance of telephone messages shall permit a physical connection or connections to be made, and telephone service to be furnished, between any telephone system operated by it, and the telephone toll line operated by another such public utility, or between its toll line and the telephone system of another such public utility, or between its toll line and the toll line of another such public utility, or between its telephone system and the telephone system of another such public utility, whenever public convenience and necessity require such physical connection or connections, and such physical connection or connections will not result in irreparable injury to the owners or other users of the facilities of such public utilities, nor in any substantial detriment to the service to be rendered by such public utilities. The term "physical connection," as used in this section, shall mean such number of trunk lines or complete wire circuits and connections as may be required

[1] Sec. 1797m-4 Revised Statutes of 1913.

to furnish reasonably adequate telephone service between such public utilities.

2. In case of failure to agree upon such use or the conditions or compensation for such use, or in case of failure to agree upon such physical connection or connections, or the terms and conditions upon which the same shall be made, any public utility or any person, association or corporation interested may apply to the commission, and if after investigation the commission shall ascertain that public convenience and necessity require such use or such physical connection or connections, and that such use or such physical connection or connections would not result in irreparable injury to the owner or other users of such equipment or of the facilities of such public utilities, nor in any substantial detriment to the service to be rendered by such owner or such public utilities or other users of such equipment or facilities, it shall by order direct that such use be permitted and prescribe reasonable conditions and compensation for such joint use, and that such physical connection or connections be made, and determine how and within what time such connection or connections shall be made, and by whom the expense of making and maintaining such connection or connections shall be paid.

3. Such use so ordered shall be permitted and such physical connection or connections so ordered shall be made, and such conditions and compensation so prescribed for such use and such terms and conditions, upon which such physical connection or connections shall be made, so determined, shall be the lawful conditions and compensation for such use, and the lawful terms and conditions upon which such physical connection or connections shall be made, to be observed, followed and paid, subject to recourse to the courts upon the complaint of any interested party, as provided in sections 1797m-64 to 1797m-73, inclusive, and such section so far as applicable shall apply to any action arising on such complaint so made. Any such order of the commission may be from time to time revised by the commission upon application of any interested party or upon its own motion.

Two important cases and a number of smaller ones have arisen under this statute since its enactment. The first was

that of *Frank Winter* v. *La Crosse Telephone Company and Wisconsin Telephone Company*, decided May 14, 1913.[1] This was an action to compel the La Crosse Telephone Company and the Wisconsin Telephone Company to connect their La Crosse exchanges for toll purposes. The Commission held in the case that the public convenience and necessity required the connection; that with a proper extra toll charge on calls between the two exchanges no irreparable injury would be done to the owners or users of the facilities of the companies and that no substantial detriment to the service of either company would result from the connection. The connection was therefore ordered, the duty devolving upon the companies to agree upon the terms and manner of making the connection. The companies, however, could not agree upon either terms or manner of connection so the Commission was again called upon, as is provided in the law, to make its adjustments, which it did in a supplemental order dated August 20, 1914.

The second important case arose in Janesville where E. D. McGowan instituted proceedings before the Commission to compel physical connection of local as well as toll connections between the Rock County Telephone Company and the Wisconsin Telephone Company.[2] The order was dated June 3, 1914. Since then the companies have agreed upon the terms of the connection, but this phase of the situation came before the Commission for adjustment. Several other cases have been brought before the Commission, in most of which orders have been made establishing the connection of the lines. The physical connection law ap-

[1] *Frank Winter* v. *La Crosse Tel. Co. et al.*, 1913, 11 W. R. C. R., 748; supplemental order in same case, 1914, 15 W. R. C. R., 36. *See also*, *A. E. Monroe et al.* v. *Clinton Tel. Co. et al.*, 1912, 10 W. R. C. R., 598.

[2] *E. D. McGowan* v. *Rock County Tel. Co. et al.*, 1914, 14 W. R. C. R., 529.

pears to be working out satisfactorily. It is accomplishing a greater flexibility in the telephone business with the resulting increase in the value of the service to the subscriber.

ANTI-DUPLICATION LAW

In 1913 the laws affecting the regulation of public utilities were amended to the end that, in the future, needless duplication of telephone systems in the rural districts, as well as in the cities and villages, may be avoided. Since 1911 cities and incorporated villages have been protected from duplication of lines by an amendment to the Public Utility Law,[1] a part of which is as follows:

> . . . no telephone exchange for furnishing local service to subscribers within any village or city shall be installed in such village or city by any public utility, other than those already furnishing such telephone service therein, when there is in operation in such village or city a public utility engaged in a similar service, without first securing from the commission a declaration after a public hearing of all parties interested that public convenience and necessity require such second public utility. . . .

As stated above, a further amendment extended the scope of this provision in 1913 so as to include towns, as well as cities and villages. This latter amendment[2] in part is as follows:

> No public utility already engaged in furnishing telephone service shall instal or extend any telephone exchange for furnishing local service to subscribers in any municipality where there is in operation a public utility engaged in similar service, without first having served notice in writing upon the commission and any other public utility already engaged in furnishing local service to subscribers in such municipality of the installation or exten-

[1] 1797m-74 (Ch. 546, Laws of 1911) Revised Statutes, 1913.
[2] Ch. 610, Laws of 1913.

sion of such exchange which it proposes to make, or make such installations or extensions if the commission, within twenty days after the service of such notice, shall, upon investigation, find and declare that public convenience and necessity do not require the installation or extensions of such exchange, except that any public utility already engaged in furnishing local service to subscribers within any city or village may extend its exchange within such city or village without the authority of the commission.

It will be noted from the above law that when proper notices have been given, unless the opposing company protests and the Commission makes an investigation and rules against the proposed extension or installation within twenty days, the company proposing the extension may proceed with its construction. This provision insures that legitimate construction will not be postponed for an unreasonable period and at the same time gives sufficient time in which to investigate the necessity of the proposed extension.

Many petitions have arisen under this law. In granting an application to Michael T. Gehl of the town of Addison, Washington County, to build a telephone line, the Commission gave an interpretation[1] of the anti-duplication law which may have a far-reaching effect on some of the smaller telephone lines of the state. The decision affects border territory either side of which line is served by a different company. The question arose whether the Commission should deny the application under these circumstances involving the anti-duplication law. The Commission ruled thus:

In border territory, like that involved in this case, there is sometimes presented a situation where some overlapping of tele-

[1] *In re Construction of Telephone line in Town of Addison, Washington County*, 1914, 14 W. R. C. R., 766. Also *see In re Violation of Law, Lisbon Telephone Co.*, 1914, 14 W. R. C. R., 131.

phone lines is required in order that public convenience and necessity with regard to telephone service may be fully satisfied. While such overlapping may at times do some injury to one of the companies, and the general policy of the law is usually against the duplication of lines which will impair investment, still it is also true that the convenience and necessity of the public itself in the matter of telephone service is the paramount consideration. Again where the public need can only be satisfied by permitting a certain amount of overlapping, the doctrine of protection for existing interests cannot be carried to its full length.

Strife among telephone companies in rural territory with its accompanying wasteful duplication of lines has been common in this state and a law of this nature fills a much-needed want in this respect. It is very common for individuals or groups of individuals in rural communities to arrive at the conclusion that a telephone line can be operated and maintained for a small amount—often as low as two, three or four dollars per year per station. Hence they reason that the company to which they are already connected, which perhaps is charging them twelve or fifteen dollars per year, is robbing them. They proceed to build a line of their own paralleling the existing company's line, and also throw out the existing company's phones. The immediate result for the company, aside from the loss due to the investment in construction, is a loss of available connections to the remainder of its subscribers. The ultimate result usually is that the rural line costs its owners much more than they originally figured on. No allowance is usually made in their computations for the fact that the line which they construct will last but a few years and then have to be replaced. Generally no annual depreciation charge is considered. When proper allowances are made for this factor, and for the time they donate in building the line, the rate which is arrived at will probably be much higher than it was originally

figured and perhaps not far from the rate which the old company was charging. It must not be considered that this is a defense of any company's existing rate. An effort has been made mainly to point out wherein many of the small companies make errors when endeavoring to furnish telephone service. It should be remembered that if rates of the existing company are too high or service is poor, adequate recourse may be had through an appeal to the Commission, upon which an investigation will be made and the proper rates or service established.

The object of the anti-duplication law is to avoid such wasteful duplication as outlined above. Since the adoption of the law in 1913, there have been up to September 1, 1914, two hundred and four cases before the Commission under this heading. These cases have sometimes resulted in formal proceedings relative to the service and rates of existing companies. Many miles of wasteful duplication of lines have been avoided and in general the operation of the law appears to be accomplishing the desired results.

CHAPTER XIV

WATER UTILITIES

A feature of the Wisconsin Public Utility Law which has caused a great deal of comment, both favorable and adverse, is that both privately and municipally owned utilities are subject to the same degree of regulation. In some of the more recent utility laws, notably that of Illinois, the municipal plants have been exempted. The reasons for the inclusion of city owned plants in Wisconsin are apparent when the purposes which the law was aimed to accomplish and some of the results which have been obtained as a result of its administration, are considered.

Foremost in the minds of the framers of the law was probably the idea that the rates of public utilities should not be excessive, but the restriction of the total revenues of public utilities to a reasonable amount was by no means the sole purpose in view. Very few publicly owned plants have been conducted as profit-making businesses. Some of them have, of course, shown a profit, but the purpose of their operation has not generally been to yield a profit. From this, it might be argued that state regulation of municipal plants is unnecessary. Restriction of total profits of utilities, important as it is, is only a small segment of the field of regulation. Total revenues may be reasonable beyond any question, and rates still be unreasonable because of discriminations between classes, as will be more fully explained at a later point in this chapter. Rates in order to be reasonable must be predicated on reasonable

service; or rates may, in fact, be reasonable, but accounts kept in such poor shape that the reasonableness of the charges cannot be proved. Municipally owned plants are as likely to indulge in discriminatory practices as private plants. This does not necessarily mean practices which are wilfully wrong. While the community would be on guard against improper practices of a privately owned utility, the municipal plant being part and parcel of the city, the attitude of watchful criticism on the part of members of the community is often missing. Except where the city's plant has been drawn into the turmoil of local politics, its practices are not subject to the public disapproval which falls, justly or unjustly, upon the private utility. When the conduct of the city's utility business is made the issue around which local campaigns are fought, the business function of the utility is often lost sight of, and the steadying influence of a state commission is badly needed. When politics determine utility policies the minority have no means of redress, except it be through their right to call upon the state to enforce practices which are reasonable.

Municipal plants, under the Wisconsin law, are subject to the same restrictions as are privately owned utilities, but the work of the Railroad Commission, especially as related to municipal utilities, is not entirely, nor even primarily, restrictive.

In some cases cities have voluntarily entered the utility business by purchasing the property of private companies, but in probably a majority of the cases, especially in the smaller cities, the municipalities have been practically forced into the utility business by the public demand for utility service in localities which were not sufficiently developed to attract private capital. Necessarily, the smaller cities have engaged in utility enterprises without much knowledge of the nature and requirements of the business. For these cities and villages the Railroad Commission

performs the functions of a consulting board. A great part of the work which the Commission has done in connection with the municipal plants has been undertaken at the request of the municipal authorities. Accounting systems have been devised and installed; rate schedules have been recommended; advice has been given on methods of securing plant efficiency, and a great deal of administrative and engineering aid has been furnished to the city plants.

More than any other class of utility, the public water supplies of Wisconsin are owned and operated by the cities and villages. What has been said with regard to the relations of the Commission to municipal plants, therefore, holds true of the water-supply business to a greater extent than of any other utility undertaking. At the present time the records of the Commission show that there are only twenty-five privately owned water plants in the state, and several of these are about to be transferred to the public authorities. For the year ending June 30, 1913, one hundred and thirty-seven municipally owned and twenty-four private plants reported to the Commission. A number of small municipal plants have been added within the past year. A better idea of the extent to which municipal ownership of water supplies has gone can probably be gained from a statement of the value of the property owned by cities and by private parties.

Class A includes utilities in cities of over 10,000 inhabitants; Class B, those in cities of from 3,000 to 10,000; Class C, those in cities of about 1,800 to about 3,000; Class D has a lower limit of about 800, and Class E includes the very small utilities.

The assistance which the Commission gives to the municipally owned utilities is outlined rather fully in another chapter. With the conditions regarding the ownership of water plants in mind we may turn our attention to some

of the purposes and results of their control by the Railroad Commission.

As in utility regulation, usually the attention of the Commission has been directed to the two questions of rates and service. Probably less has been done throughout the country generally to put the rates of water utilities upon

TABLE SHOWING NUMBER AND BOOK VALUE OF MUNICIPAL AND PRIVATE WATER UTILITIES—BY CLASSES

Class	Municipal		Private	
	Number	Value	Number	Value
A	12	$11,883,120.97	10	$7,641,883.24
B	36	2,968,346.32	8	1,559,190.92
C	20	747,614.14	2	433,258.68
D	22	425,555.40	2	27,469.00
E	47	729,707.97	2	11,500.00
Total	137	$16,754,344.80	24	$9,673,301.84

an equitable and reasonable basis than in any other line of utility operations.

With the passage of the Public Utility Law there was a rather general belief that rates of all classes of utilities would undergo sweeping reductions. The public knew little of the actual extent to which charges of utilities were unreasonable and extortionate but there was a feeling, well founded in many cases, that the utility business was yielding profits beyond a reasonable return. What the conditions were in the water-works business the public did not know. The period from 1885 to 1890 was the boom period in water-works construction in Wisconsin. A large number of plants were constructed by private capital during these years. After a period of nearly twenty years in which the business was being developed, it was perhaps natural that

there should be a general feeling that the water utilities must be tremendously and unreasonably profitable. Those who saw in the utilities law the instrument for radically reducing the earnings and charges of water-supply plants have failed, in large measure, to have their expectations realized. Actual study of water utility operations and finances shows that, except in a number of individual cases, the public water-supply business has not been excessively profitable in Wisconsin. Some plants have shown large earnings but this has not been characteristic of the industry.

The causes of this condition are various, but there are a few which have been so generally present that it may be well to mention them. Perhaps the foremost of these causes is the failure of the municipalities to pay the full cost of fire protection. Where the water plants are municipally owned and operated there has been a more or less general failure to recognize the fact that the furnishing of fire protection costs money and that the city itself should meet this cost. Even where the plants have been privately owned the fire protection has usually been furnished at far less than cost. The fire protection rate has been the result of bargaining between the city authorities and the company. The result has been a rate for this service, less than the actual cost of supplying the service. With the rate for fire protection fixed at less than cost, the private consumers must pay more than their proper share of the utility's expenses or the business must be conducted at a loss. Because of the fact that cities have not paid their share of the expenses of conducting the water business, general reductions in rates to private consumers have often been impossible, unless the charge for fire protection were raised to its proper level.

Before attempting an explanation of the principles applied by the Wisconsin Commission in adjusting water

rates, it may be well to touch upon the various types of schedules which the Commission has found in Wisconsin.[1] Of the large number of water utilities operating in Wisconsin practically every one, if not every one, furnishes some degree of fire protection. In almost every case the rates which have been in effect for fire protection related in some manner to the extent of the distribution system rather than to the actual extent of the protection which the utility has been in a position to furnish. For example, we have in one city a schedule which provides that the charges for fire protection shall be $40.00 per hydrant per year, regardless of the number of hydrants installed. In another city the charge is $100.00 for each of the first fifty-four hydrants, which apparently are set upon the original distribution system, $60.00 for each of the next forty hydrants, and $50.00 for each additional hydrant. Still another class of charges for fire protection is exemplified by a schedule in force in this state which provides for a charge of $400.00 per mile of main per year.

The disadvantages of a charge based upon the extent of the distribution system or upon the number of hydrants must be obvious. In order to furnish adequate fire protection, a water plant must have a plentiful source of supply, it must have sufficiently powerful pumping machinery, it must have distribution mains sufficient in extent to enable it to deliver water to any point where there is a fire risk, and its distribution system must be sufficiently well equipped with hydrants so that the water can be used most advantageously.[2]

When the rate for fire protection is based upon the

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[1] *See* Ch. X, for methods of rate-making or water utilities and citation of leading cases.

[2] In the preparation of this chapter reference has been had to an address by Mr. Erickson, *supra*, before the American Water Works Association, and to an unpublished report by the Statistical Department.

number of hydrants in use, the inevitable tendency on the part of those paying for fire protection will be to restrict the number of hydrants. Hydrants will be placed too far apart, or if the franchise requirements state that hydrants shall be placed at specified intervals upon the distributive system, the tendency will be to restrict the development of the distribution system itself.

In the same way, when the charge for fire protection is based upon the number of miles of main installed, the tendency will almost inevitably be to limit the extent of the distribution system, which in turn will decrease its efficiency as a protection against fire, and in the cases of water plants supplying both fire protection and general service will lessen the value of the distribution system as a means of supplying general consumers. At a later point in this discussion we will take up further the argument that the fire protection should be considered as a unit for purposes of charging for the service.

There are a few cities in Wisconsin, especially those where the Commission has reviewed the water rates, in which these conditions have been remedied. The proper schedule would provide, for instance, for a charge of a lump sum for existing fire protection, which was designed to cover all the costs connected with furnishing such protection, and for such additional charges as should be made because of extension of the distribution system. These additional charges are such as are warranted by the cost of extending the service and are designed not to unduly restrict the extension of service.

Aside from the fire protection which the water utility furnishes, the great majority of water plants supply water for general purposes which for the sake of convenience may be divided into three classes: first, that which is supplied through meters; second, that which is supplied to domestic and industrial users upon the basis of the number

of fixtures and the character of the premises supplied; and third, that which is supplied for incidental purposes such as street sprinkling. Taking up the last of these three, we find a number of types of schedules in use in Wisconsin, some of which are illustrated here. In one city a charge is made of six dollars per month for each sprinkling wagon. In another the charge is six dollars per wagon per season. That is, in both of these cases, the wagon per month or wagon per season is considered as a unit for purposes of charging. In other cases all street sprinkling is paid for in a lump sum per year. In still other cases a charge is made per front foot of abutting property or per mile of street per season, and in a few instances the water is actually metered and charged for on a meter basis.

No attempt can be made at this point to review all the types of flat rate schedules which are in use at the present time. In a general way it may be said that the charges which are made upon a flat rate basis relate, first, to the character of premises supplied; second, to the number of fixtures through which water may be taken at those premises, and third, to various other elements such as the number of rooms or the number of persons supplied from the service in question. Wherever the water business is at all developed the flat rate schedules are unwieldy and poorly adapted to such uses of water as are not easily classified. The first result of this has been that in almost every flat rate schedule existing in any large city there have sprung up a number of special rates which are very often discriminatory. But even where special rates do not exist the flat rates in themselves are almost inevitably discriminatory.

If there is any theory aside from getting all that the service will bear, upon which flat rate schedules are based, it must be that for each class of premises and fixtures

there is a normal and reasonable use of water which can be approximated with some degree of accuracy and charged for without actual measurement. It is apparent, of course, that this is true only in a very general way, and to a limited extent, but even if it is true that there is a normal and reasonable use of water which can be determined without actual measurement and charged for, the difficulty with the flat rate schedule comes right at this point. The consumer who is wasteful in his use of water and who uses more than a normal and reasonable amount is causing an expense to the utility which is being borne by consumers who are careful in their use of water and who are not causing any waste. When a utility sells water through a kitchen faucet, for example, to a residence of five rooms, it really sells a quantity of water, which quantity is not the maximum amount which can be drawn through that faucet, but a reasonable amount for use in a residence of the size and character in question. This reasonable amount is, of course, a very indefinite and unsatisfactory measure, but such as it is, it forms the basis for the only justification of the flat rate plan. When the use exceeds a reasonable one the number and nature of fixtures are no longer any index of the amount of water used, and at that point some more definite and certain system of measurement must be introduced. Where the flat rate plan breaks down, therefore, as it does to a greater or less extent in the majority of water plants, it becomes necessary to introduce the meter system of selling water. That the meter system is theoretically correct hardly admits of argument. The only cases in which metering may not be the proper method of dealing with the sale of water would be cases in which the costs involved in connection with metering, the interest, depreciation, and taxes upon the meter and its connections, the reading and maintenance, the office work involved in keeping records and the other expenses connected with the

use of the meter system would more than offset the saving which would be effected by the decreased *consumption*, or rather by the decreased *waste* of water. In cases where the available water supply is being overtaxed or where the distribution system is not properly designed to furnish adequate pressure at consumers' premises when the flat rate system prevails, the use of meters will often decrease the waste of water so much as to make the existing supply adequate and the distribution system large enough to furnish the necessary pressure. As in almost all of the classes of water service, the meter rates which are now in use have not in general been the result of any careful analysis. Meter rates are frequently copied bodily from those in use in other cities. City after city in the state of Wisconsin can be found with regressive schedules of meter water rates which are almost entirely identical, with the possible exception of the exact number of cents which should be charged per thousand gallons. Instances have been found in Wisconsin where schedules were so badly regressive that a consumer could use two and one half times as much water as another used and still pay the same amount, and where all intermediate consumers paid less than either one.[1] The argument which has been made in favor of such schedules is that they afford a rate by which very large consumers can be taken on. This is often very true, but the discriminations are so marked and so unjustifiable and all the good results which can be obtained can be so easily reached by other forms of schedules that a regressive schedule can hardly be justified in any case.

Where the regressive schedule is not in use the most general type of meter rate provides for a decreasing charge per unit as more water is used, but does not allow the use of a large quantity for the same amount or for less than

[1] *See* Ch. XX for diagram of regressive rates.

is charged for the use of a smaller quantity. The principal variation in the non-regressive schedules arises from the manner in which the minimum charge is assessed. In some cases there is a minimum charge per quarter or per half year of the same amount for each size of meter. In some cases the minimum charge for large meters is greater because the amount of water which can be used under this minimum is greater than in the case of small meters. In some cases a service charge varying according to the size of the meter is made use of and in still other cases a varying minimum charge which is greater for the large sizes of meters, but which permits the use of the same quantity of water for all sizes of meters and thus combines in effect the ordinary minimum bill and service charge, is in use.

Separate plants which furnish fire protection and general service would differ in many respects. For fire protection the system must generally be so designed that a great amount of water, under high pressure, can be furnished at any point to be protected, the amount of water which can be delivered in a given time depending upon the nature of the risks in the area affected. There must be powerful pumping machinery, a plentiful supply of water, large mains capable of withstanding pressure and a sufficient number of hydrants. If the system were to serve the commercial and industrial consumers only a somewhat different set of requirements would be found. The supply of water must be pure, it need be delivered only under moderate pressure and the distribution system need not usually be designed to furnish a large amount of water at any point to which the system extends. When, as is usually the case, one water-supply system serves both purposes, the system must be able to meet the requirements of both classes of service. There are certain economies resulting from the use of a combination system, economies both in construction and in operation. There may be some

respects, too, in which the combined system is more expensive than separate systems would be. In general the combination has so many advantages that separate systems are seldom used. Because of the fact that water plants serve two widely different purposes, which makes the investment somewhat higher than it would be for either service separately, it becomes necessary to apportion the property so that each branch can be assessed with its fair share of interest, profits, and depreciation.

In an attempt to determine the cost of each of the two classes of service, as a basis for charges for each class, as well as for individual consumers or classes of consumers, it is important that we have in mind what the nature of these costs is. Because the two branches of service are supplied by the same utility it follows that many of the expenses involved are joint expenses. Water is taken from the same source of supply; very often the same boilers and pumps are used, and delivery is effected through the same mains. It is impossible to actually keep the expenses of the two classes separate. Some method or methods of apportionment must be resorted to. What these methods should be must depend largely upon the nature of the expenses and the elements which cause them to be present. The methods followed by the Commission in making water rates have been explained rather fully in Chapter X so that in this chapter the discussion may be confined to the various types of schedules and methods of charging which have been in use or which are recommended by the Commission.

The Commission's method of fixing water rates may be objected to on the ground that it does not lead to the full realization of the theory of demand, consumer, and output costs, on which it is based. In the sense that these elements are recognized in a well-adjusted schedule of electric rates, it is true that the schedule of water rates is not perfect.

Because of the manifest impossibility of determining mathematically correct ratios for the distribution of demand expenses and because, in the case of very large users, the business of a water plant becomes subject to competition, it is true that the theory of demand rates for general water service cannot be fully carried out in practice. All that is claimed is that such rates as those outlined above constitute a step in the right direction and about as great a step as the practical matters involved make possible. In no other line of public utility business is the quality of the service furnished of as great importance as in that of public water supply. Poor electric lights or low-grade gas are serious because they affect the convenience of the users very materially, but the problem of improper water service is only to a relatively small degree a question of convenience. The condition of public health is so closely related to the purity and adequacy of the public water supply that, important as the question of convenience may be, it is overshadowed by the more vital matter of the public health.

There are two requirements which the needs of public health put upon the water-supply systems. Under modern conditions of life the sanitary requirements of urban populations require a rather large quantity of water which must be available at prices which will not discourage its proper use. One of the advantages claimed for a minimum bill rate as distinguished from the service charge rate is that, with a minimum bill, consumers are encouraged to use water up to the amount coming under the minimum, which amount is usually sufficient for sanitary purposes. With the service charge rate, there is a charge for each unit of consumption, which, it is claimed, discourages the use of even the minimum amount of water required for proper sanitation. It is stated that in Milwaukee, even with a uniform rate of only six cents per thousand gallons, with

no minimum bill, the effect of the rate is to cut the consumption of large classes of the population far below the sanitary requirement.

Investigators in Milwaukee have stated that it was not unusual to find places where toilets were flushed only once a day. With a rate of six cents per thousand gallons, $1.50 per year would provide an adequate supply of water for all ordinary sanitary requirements for an average family. This shows the importance of an understanding of service conditions in connection with rate-making.

Quality of water rather than the extent of the supply is the other important element in the general service of a water utility. The necessity of pure water is so well understood that it is surprising to find as large a number of contaminated supplies as still exist. Methods of purification are not well understood in the smaller plants, and people generally have not placed so high a value on the public water supply that they will bear the frequently heavy cost of developing pure supplies. The case of the La Crosse water works is illustrative. The city of La Crosse took its water from the Mississippi River, which was so badly contaminated that the water was unfit for general use. After considering all possible methods of remedying the situation the Commission ordered the city to abandon its river supply and develop a set of wells from which the supply should be obtained. This new source of supply is now in use.

Another requirement of service is that imposed by the necessity for adequate fire protection. In a number of cases the Commission has found it necessary to order improvements in order to secure adequate fire protection. In Sheboygan reënforcement of the distribution system by the installation of large auxiliary mains leading directly to the areas affected, was ordered. At Beaver Dam the problem was one of station capacity, and new boilers and

pumps were required. General improvement of the system was ordered for Antigo, in order that fire protection would be adequate. Extensions of mains to serve outlying districts have been ordered in a number of other cases, notably in Madison and Beloit.

Aside from the regulation of rates and service the Commission has made valuations of a considerable number of water plants for purposes of municipal purchase, but these are discussed at another point in this book.

CHAPTER XV

THE INDETERMINATE PERMIT AND CONVENIENCE AND NECESSITY LAWS

To prevent unnecessary duplication of public utility properties in the future; to accomplish a thorough regulation of existing plants by state control of rates, service and securities, and to subject these utilities to municipal purchase at the will of the community, are results attained through the convenience and necessity and indeterminate permit laws administered by the Railroad Commission.

The first of these statutes applies only to proposed extensions or new undertakings. Before a railroad or utility may enter a field, it must secure the Railroad Commission's approval—a provision designed to obviate unnecessary duplication of properties. The certificate issued by the Commission is fundamentally a franchise. It is granted or refused only after public hearing and may be revoked by the Commission for failure to utilize the same within one year after date of issue.[1] The doctrines involved here are an abandonment of the principle of free competition; a recognition by the state that these enterprises are virtually monopolies. Laws enacted in nineteen different states now require the use of certificates of convenience and necessity by either railroads, utilities, or both, for new undertakings.[2]

[1] Sec. 1797—44-52 (Ch. 454, Laws of 1907) and Section 1797 m = 74 n, Revised Statutes of 1913.

[2] Arizona, California, Connecticut, Idaho, Illinois, Indiana, Kansas, Maine, Maryland, Massachusetts, Michigan, Missouri, New Hamp-

All existing franchises of utilities in Wisconsin regardless of term limitation were revoked under a law enacted in 1911, and the companies have been given indeterminate permits. This legislative enactment was preceded by a law in 1907 which gave the companies the option of surrendering their franchises and receiving in lieu thereof indeterminate permits. Doubt as to the legal right of directors and stockholders to make the surrender without the consent of bondholders,[1] the practical impossibility of ascertaining all bondholders and securing their consent, and the ill-conceived idea of the value of their franchises, deterred a large number of utilities from voluntarily coming under the law.[2]

How this much-discussed optional statute operated is indicated in a letter written by Commissioner Erickson under date of December 17, 1913, to Professor G. A. Gesell, Minneapolis, Minnesota. An extract from the relevant portion of that letter follows:

I have taken these figures for the year 1911, as that year marked the end of the period in which companies could voluntarily surrender their franchises. I find that at that time there were 140 private electric utilities reporting to the Commission, of whom 53 voluntarily surrendered their franchises. There were 40 private gas companies, of whom 15 had surrendered their franchises; 31 private water utilities, with 19 franchises surrendered; and 14 heating utilities, with 7 franchises surrendered.

The following table shows the total property and plant of companies which voluntarily took the indeterminate permit, and the total property and plant of all private utilities reporting for

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shire, New York, Pennsylvania, South Dakota, Vermont, West Virginia and Wisconsin.

[1] Farmers Loan and Trust Co. of New York, acting as trustees for the bondholders of the Racine Water Works Co., have begun litigation in the federal court for the Eastern District of Wisconsin to determine the legality of this principle.

[2] John H. Roemer, "Certain Important Provisions of the Public Utility Law of Wisconsin," 5.

the year; also the total operating revenue of all companies voluntarily taking the indeterminate permit and the total operating revenue of all private utilities reporting for the year; and also the percentage relation existing between the companies which took the indeterminate permit and the total of all companies.

Utility	Property and plant of companies receiving indeterminate permits	Total private property and plant	Per cent	Total operating revenue of companies receiving indeterminate permits	Total private operating revenues	Per cent
Electricity	$10,822,218 61	$38,166,778 44	28 4	$2,027,263 65	$5,238,614 41	38 7
Gas	5,497,247 22	25,063,185 93	21 9	820,375 50	4,159,159 64	20 7
Water	9,602,280 50	10,361,337 47	93 2	[907,006 37	982,392 63	92 3
Heat	921,550 26	1,278,419 71	17 2	150,542 48	231,944 56	64 9

You will note that telephone companies are not included because the indeterminate permit feature did not apply. Telephone companies in this state never had municipal franchises. Their franchises were granted directly by the state and consequently there was no municipal franchise to surrender.

It soon became evident that it would require many years to accomplish the purpose, so the legislature of 1911, acting under the reserve power of the constitution to alter or repeal corporation franchises, amended every utility franchise in the state, making it an indeterminate permit. This law gives a uniformity to franchise permits and subjects all utilities to the terms of the Public Utility Law. The validity of this legislation has been sustained by the supreme court of the state.

The legal right to grant a franchise is based on the principle that it will minister in some capacity to public welfare. Before the enactment of the Public Utility Law, franchises were granted to public utility companies by cities acting as the agents for the state. Sometimes these permits were for a limited period of years and at other times perpetual. Often they were exclusive as to all pos-

sible competitors. Because of changing and unforeseen conditions, such as improvements in the utility business and the rapid increase of population, it was practically impossible to frame a franchise that would cover the requirements arising through a term of years. Several of the factors that prompted the legislature in abrogating all franchises were their incongruous provisions, their inconsistencies and their utter failure to secure proper regulation by this system.

To clearly distinguish public advantages under the indeterminate permit law, a review of regulation through franchise provisions will be necessary. The franchise formerly held by Wisconsin utilities has been defined as "a grant by the state of special privileges and immunities and with corresponding obligations and [1] responsibilities on the part of the grantee, that it is always the creature of the state and in Wisconsin is subject under constitutional reservation to revocation or amendment; that the acceptance of the grant implies an assumption to furnish reasonable service to the public at a reasonable charge and that though under the conditions existing prior to direct state regulation by a Commission, there was virtually no exercise of the regulatory powers which were in the legislature, yet these powers existed and every franchise was subject to them."

Many of the perpetual franchises were so devoid of limitations that more power was imposed in the utilities than should be exercised by a private corporation serving a public need. Their terms operated as a barrier to secure the readjustments of differences that develop from time to time in a growing community. The very perpetuity of the provisions was viewed as a valuable right that led to overcapitalization and made the managements arrogant

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[1] Halford Erickson, Unpublished article on Indeterminate Permits.

and unwilling to make the improvements and rearrangements of service deemed necessary under public regulation in the interests of the general welfare.

Equally serious were the objections against the short-term franchise. The limitation of term made rates unnecessarily high in order to secure a return of the capital invested before the period of operation expired. Where the right to operate is indeterminate no allowance other than depreciation is required for the restoration of original capital invested. Rates to consumers can be reduced correspondingly. But the uncertainty of securing a renewal of a limited franchise grant tended to restrain the entrance of capital into enterprises; limited the extensions of new service lines and community development and encouraged the management to allow its plant and service to deteriorate that its loss might not be so great at the day of franchise expiration. Such conditions frequently compelled the company to enter into politics, which led to all sorts of dickering with councils, to obtain a renewal. The shirking of many of the responsibilities that have later been imposed under the indeterminate permit were not only tolerated but complacently borne by the public under a system of franchise control.

Again, under franchise regulation, some cities proceeded on the policy that low rates and good service could be secured only through competition. Several plants were awarded franchises to render service in one locality. Time and experience have demonstrated this to be a mistaken economic theory. Two utilities covering the same territory double the investments—buildings, equipment and distribution systems—and each must maintain separate business organizations. Under this method two plants are required to do what one plant could as well accomplish at less expense. Economic waste is the result. Competition thus secured is usually of short duration. It confines it-

self largely to first choice customers. Once a consumer is connected to one system he finds it impossible to change to another plant without a greater expense than any possible saving in rates. This contest for new customers often results in rate wars that inevitably culminate in one or both companies going bankrupt; the service to the public is seriously crippled and in the end one plant buys the other's property. The enterprise is then made the object of new stock issues often in excess of the combined valuations, thereby saddling the public with additional burdens. Or perhaps a compromise between the utilities may be effected. The companies either divide territory or agree on rates. Competition as a regulator is then dead.

Reason for the failure of regulation through competition is to be found in the fact that these utilities are essentially monopolistic. There may be competition between merchants; there cannot be continuous competition in utility properties. This is because of the character of the utility business. The cost of production of a merchant's goods is not increased by the number of stores in a city. In the gas industry which uses the public streets, duplicate investments are necessary in order that two companies may serve consumers on one street. An increase in investment means an increase in cost of production and high rates for service. If gas could be bought in a pail at a store and carried home the situation would be analogous with that of the storekeeper.

To eliminate the evils under franchise regulation the legislature adopted the indeterminate permit law.

Like the franchise, the indeterminate permit gives the utility the right to occupy streets for the purpose of delivering a needed service to the public, subject, however, to all the terms and requirements of the Public Utility Law. Another reason why competition should be restricted is that duplicate equipment crowds the streets and highways

with unsightly obstructions. Moreover, under conditions of strict control the existing utility is subjected to far-reaching regulation. It must maintain good service; provide capital for the needed extensions, and keep its plant in operation, even at a financial loss. Under such circumstances the legislature in enacting the indeterminate permit law believed that reasonable protection from competition within its field was but just.

Speaking of the effect of duplication both upon the rates and the cost of the service, Commissioner Erickson has said:

In connection with the application for certificates of convenience[1] and necessity that have come before the Wisconsin Commission, I have often had occasion to investigate the effect upon the existing utility and customers as well as upon the municipality of dividing up its business with an additional plant. In these investigations I have almost invariably found that such a division of the business would have greatly reduced the net earnings of the existing plant, while at the same time it would have seriously increased the cost per unit of service to the public. Time will not permit me to go into details. But in one case where the city officials desired to erect a municipal plant for the purpose of lighting its streets and public buildings, it was found that the granting of this application would have decreased the revenues of the existing company by considerably more than twice as much as it would have decreased its expenses; that it would have caused an increase of about 15 per cent in the cost to the city of the street and other public lighting; that it would have increased the cost per kilowatt hour to private lighting and power users of the city by nearly 20 per cent; and that these increases in the costs were far-reaching enough so that under rates that were high enough to cover them it would have been impossible to expand the electrical business or even to retain all of the business the existing plant then had. To have granted the certificate under such conditions could hardly have been in line

[1] Commissioner Erickson, Address at Cedar Point, Ohio, July 23, 1914.

with public policy. And yet because the certificate was not granted, the Commission has been bitterly criticized, not only by local interests but by persons outside of the state.

The essential differences between the franchise and the indeterminate permit are to be found in the fact that:

First—The indeterminate permits recognize the monopolistic character of these utilities and prohibit new competition until public convenience and necessity, as determined by the Railroad Commission, require the operation of a second utility.

Second—The right to operate is indeterminate, subject to the consent of the city to purchase the property at any time at a price to be fixed by the Railroad Commission.

The principle embodied in the indeterminate permit was early recognized in Massachusetts in granting franchises to street railway companies.[1] Wisconsin, however, was the first state to substitute it for the special franchise and give the law a general application. If commission regulation were to enforce proper service and reasonable charges based upon cost of operation, corporations, operating under special term franchises which had not maintained amortization funds to mature at the expiration of the terms, could give assurance neither to capital nor to the public being served of a maintenance of satisfactory conditions. The indeterminate permit offers a remedy. It aids in carrying out the chief purpose of regulation which has been succinctly summarized by the supreme court thus: "Service as efficient, as practicable, at as low rates, as just[2] and practicable, under the circumstances of each particular situation."

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[1] Charles Francis Adams, Secretary Massachusetts Special Committee (1898), "Relations Between Cities and Towns and Street Railways," 17. *The Annals of the American Academy of Political and Social Science*, May, 1914, LIII, 136.

[2] *Calumet Service Co.* v. *Chilton*, 148 Wisconsin Reports, 334-364.

No better explanation of the purpose and scope of the law can be found than that contained in one of the Commission's early decisions, which said:

By making a surrender of its franchise and accepting in lieu thereof [1] an indeterminate permit, a public utility acquires, in effect, a legally protected monopoly and the right to continue its public service indefinitely. Such monopoly cannot be destroyed except it be established that public convenience and necessity require a second public utility to engage in the same business in the municipality. By extending its plant to meet the public exigencies as they arise, and by discharging its public functions properly, a public service corporation may maintain its monopoly of the business as long as it continues operation. Neither can its enjoyment of such monopoly nor its right to remain in the public service be terminated by the municipality, except upon payment to it of "just compensation" for all its "property actually used and useful for the convenience of the public." As a consideration for the valuable privileges thus guaranteed, the law provides that the term of the license or franchise authorizing the maintenance and operation of the plant be determinable at the will of the municipality.

In the same litigation the Commission previously held that the indeterminate permit is

more valuable than the ordinary special franchises, because the company [2] now has a legally protected monopoly and is subject to no different supervision and regulation than it would have been had it continued to operate under its original grant. Furthermore, its investment is now protected not only against the consequences of competition, but also against the possibility of total loss on the expiration of the original grant. It can never be deprived of its property except on the payment of the fair value thereof by the municipality.

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[1] *In re Appleton Water Works Co.*, 1910, 6 W. R. C. R., 119.

[2] *City of Appleton* v. *Appleton Water Works Co.*, 1910, 5 W. R. C. R., 284-285.

Moreover, the courts have held that the scope of privilege acquired by surrendering a franchise and taking out an indeterminate permit under the Public Utility Law is the same as under the old franchise; that the multiplicity of differences existing in franchises are brought under one system and subject to a single standard—the requirements of the Public Utility Law—and that the provisions of the Public Utility Law, "providing methods by which a municipality may become the owner of a public utility business, by implication prohibit the municipality from becoming the owner of the plant in any other way."

Opposition to the indeterminate permit is based on the fact that it changes all term franchises into what are virtually perpetual franchises, and that it prevents competition by fostering monopoly.

The first distinction is not entirely correct. Justice Timlin pointed out in his opinion in the Calumet Service case, that

> the indeterminate permit obtained upon surrender of the preëxisting[1] franchise is not necessarily a perpetual permit subject only to the conditions presently prescribed in the Public Utility Law. That law is subject to repeal or amendment by other statutes.

Likewise, the supreme court has had occasion to point out that such utilities have not all the characteristics of a monopoly. In the same case the court said:

> So while, in common parlance, it is proper to characterize the exclusive privilege in question, a monopoly, it is one purchased by giving an equivalent to the public, as in case of a patent allowed by the federal government. It is a grant for a public, not for a private purpose, and not a grant of that which, without it, would be of common right. It has none of the essen-

[1] 148 Wisconsin Reports, 334.

tials of the monopoly as offensive, anciently, in the eye of the law.[1]

While the indeterminate permit is often referred to as an exclusive privilege, an examination of the law shows this is not an exact fact. The statute empowers the Railroad Commission at any time to admit a competing utility if after a public hearing it appears that public convenience and necessity require such competition. The existence of this provision enforces good behavior. In no instance has it been necessary for the Commission to grant a permit to another utility to compete. The law robs the monopoly of the power to charge other than just rates. Thus after quoting the provisions of the indeterminate permit law, the supreme court has said:

> The purpose of it (indeterminate permit law) is obvious. The intent was to give the holder of an indeterminate permit within the scope thereof, a monopoly, so long as the convenience and necessity of the public should be reasonably satisfied, yet to secure to the public the benefit of the monopoly in excess of a fair return upon the investment, under proper administration, by insuring to the consumer the best practical service at the lowest practical cost.[2]

The method of obtaining a permit under the law is simple. Where no utilities are in existence within a municipality, application is made by the promoters of the enterprise direct to the municipality, in which the larger portion of the utility will operate, for the privilege of using its streets. When this application is granted it is recognized in law as an indeterminate permit subject to all of the provisions of the Public Utility Act. If a utility, however, is already in existence in the municipality, application is made direct to the Railroad Commission for a certificate of public

[1] *Calumet Service Co.* v. *Chilton*, 148 Wisconsin Reports, 334, 359.
[2] 145 Wisconsin Reports, 337, 346.

convenience and necessity. Even if the Railroad Commission grants the certificate the applicants must still obtain a permit of the municipality to use the public streets. These grants are surrounded with all of the safeguards necessary to preserve the paramount purposes of the Public Utility Law.

The recognized principle back of the law is that regulated monopoly is better than unregulated competition. The statute operates to reduce unreasonable earnings of a public utility company, and hence, forces the rates to consumers below those which would be inevitable under a limited franchise. By preventing unnecessary competition investments are given greater stability.

Under the indeterminate permit law no device for profit sharing or profit distribution shall be lawful between a utility and its customers until the Commission shall find it to be reasonable and just. Advocates of home rule and the opponents of the indeterminate franchise argue that regulation can be secured under a profit-sharing scheme or by a system of amortization. A close analysis of the facts from an economic and social point of view indicates quite clearly that this toll or tax is not based on sound economic principles.[1] Commissioner Erickson found that "for five typical lighting plants serving cities in which the population ranged from about 1,000 to about 350,000 inhabitants the annual charges necessary for amortizing cost of the plants in twenty years on a 4-per-cent sinking fund basis amounted to from 1.33 cents to about 2.00 cents per kilowatt hour for the ordinary short-hour lighting user and from about .5 to nearly 1 per cent per kilowatt hour for the average eight-hour-a-day power user. It is hardly necessary to say that these excesses in the rates because of the amortization charges are great enough to be bur-

[1] Halford Erickson, Regulation versus Profit Sharing, in *Aera*, Mar., 1914, 7.

densome to the ordinary user, and to prevent the proper development of the service, or saturation of the territory."

A 4-per-cent tax on the gross earnings of the Milwaukee Street Railway system would amount "to 11 per cent of the net earnings for its city service, to about 103 per cent of the net earnings for its suburban service, and to about 17 per cent of the net earnings for its interurban service. Again, such a toll would increase the cost per city passenger about 1/5 cent and the cost per city car mile by more than 1.1 cents. Further, it reduces the paying car and passenger haul by 0.53 mile. In this case, a toll of this kind would thus absorb 3 per cent more than the entire net earnings of the suburban traffic, while on the rest of the line it is enough of a burden to be a material drawback in the proper development of the service."

Similarly, a 4-per-cent tax on the earnings of the Mosinee Electric Company would increase the rate to consumers two cents per kilowatt hour. The public desires reasonable rates and good service. A franchise burdened with tolls or extra charges shifts undue burdens on the consuming public and deprives the customer of the lowest rates consistent with the service furnished.

By providing that a city may purchase a plant at any time at a fair valuation, amortization or the writing-off of the cost of the plant is unnecessary. By requiring just rates and service through regulation it would seem unfair to compel the customers to pay an additional amount either in the form of a tax or for amortization. The lower the rates the more the service is utilized.[1] Special taxes may make rates so burdensome as to check the use and development of the business. "Among the most striking examples of the effect of reduced fares is the increased density

[1] *See* Ch. XXI for table showing rapid development of service under a reduction of rates.

of traffic which followed the passage of the two-cent fare law in Wisconsin.[1]

The charge is commonly made that public utility regulation and the indeterminate permit law operate to hamper municipal operation. That this is not a fact is indicated by the records of the Wisconsin Commission. Since 1907 thirteen public utility plants have been purchased under this law, as follows:

Cashton (Electric)	$ 31,000
Appleton (Water Works)	255,000
Lake Geneva (Water Works)	86,500
Manitowoc (Water Works)	236,000
Brodhead (Electric)	40,000
Manitowoc (Electric)	137,500
Antigo (Water Works)	128,800
Fond du Lac (Water Works)	320,000
Sheboygan (Water Works)	415,000
Kaukauna (Electric)	50,000
Whitewater (Water Works)	75,000
Oshkosh (Water Works)	525,000
Beaver Dam (Water Works)	133,000

At the present time the Commission is valuing the million-dollar plant of the Racine Water Works Company, a $75,000 electric plant at Grand Rapids and a plant of about $250,000 value of the Janesville Water Works Company, all three of which are being subjected to municipal purchase. The method by which a city obtains control of a private plant is simple. If a vote of the people determines that it favors the purchase of a local utility, the Commission under the law must make a valuation of the plant and arrange for the turning-over of the plant at a just compensation to the municipality. While the indeterminate permit law is by far the most thoroughgoing of any piece of legislation of this character enacted in the United States, it would

[1] Judge E. Ray Stevens, decision in Duluth Street Railway case, Circuit Court, Dane County, July 28, 1914.

seem that there is one phase of legislation along this line that has not yet been developed. The right of a city to purchase an existing property should be extended to private concerns so that, in case the public desires, a private company rendering inadequate service may have its properties purchased by another private company at a fair compensation to be fixed by the Commission. That this would give a further safeguard as a service developer cannot be gainsaid. Such legislation has the approval of Commissioner Erickson of Wisconsin and of Commissioner Milo R. Maltbie of the first district New York Public Service Commission.[1]

The public advantages under the indeterminate permit over the term franchise were well summarized by William J. Norton, when he said:

> Under state regulation, which assures the public adequate service at reasonable rates,[2] a protection of the monopoly from competition and the elimination of all possible risks to capital invested result in benefits to all parties concerned. "Without protection of such monopolies only a limited supervision of their affairs by public authorities can be morally justified. This is almost axiomatic."

Those advocates of the short-term restrictive franchise will discover sooner or later that burdens imposed upon public service companies rest heaviest upon the public served and that in order to secure the best service at the lowest rate the company must be given every advantage to develop and prosper. The Massachusetts committee sums up the situation in Great Britain as follows:

> "The term franchise has there been universal since 1870 and the rights of the municipalities are so very carefully protected that their best interests have been systematically sac-

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[1] Milo R. Maltbie, The Indeterminate Franchise for Public Utilities, 4.

[2] *The Annals of the American Academy of Political and Social Science*, May, 1914, 145.

rificed. The municipalities have, in fact, been so afraid they would be outbargained that they have as a rule fairly overreached themselves; and now, after a lapse of twenty years, they are naturally served by undeveloped lines, with antiquated appliances, simply because they made it the distinct interest of the companies operating those lines to provide nothing better."

They conclude that the indeterminate permit, even without the provision for the payment of a just compensation upon revocation of the grant by the municipality, has given a greater security to capital and induced markedly better service conditions.

CHAPTER XVI

REGULATION OF STOCKS AND BONDS

Before railroads and public utilities can issue securities in Wisconsin they must first obtain the approval of the Railroad Commission. The original Wisconsin stock and bond act was enacted in 1907, the provisions of the Texas, the Massachusetts and the Minnesota laws being used as a basis.[1] Investigations indicate that Texas was the first state to enact a statute of this character, but it was applicable to railroads only. Under it the Railroad Commission was given power to approve bonds that did not exceed the value of the property as fixed by the Commission. The Massachusetts law applied to the issues of stocks and bonds of railways and street railways and the Minnesota statute to the stock issues of railway corporations. Just before the Wisconsin law was finally enacted the Minnesota law was declared unconstitutional as an unlawful delegation of legislative powers. This necessitated a complete change of the provisions of the pending legislation and the enactment of a much weaker statute than was originally intended. The present law, enacted in 1911 and amended in 1913, preserves many of the basic administrative features of the 1907 act. It is more comprehensive, however, in correcting the evils it was intended to remedy.

[1] *In re Southern Wisconsin Railway Co.*, 1907, 2 W. R. C. R., 55. The Texas law became effective April 8, 1893. For a résumé of accomplishments under the Texas law, *see* Charles S. Potts, Article in *The Annals of the American Academy of Political and Social Science*, May, 1914, LIII, 162.

Necessity for this legislation, reflected in the passage of laws of varying scope in twenty-one different states,[1] is found in the evils of overcapitalization. Watering of securities makes them speculative instead of stable, keeping bona fide investors out of an otherwise attractive field. The small investor, who otherwise might place his money in local public utility securities, aiding thereby to establish more amicable relations between the public and the utility, turns aside to make his investments in more certain fields. This is because excessive capitalization weakens the assets and diminishes or makes doubtful the expected profits. Moreover, to keep up interest and profits on fictitious issues leads to demands for rates that are excessive. Overcapitalization increases the financial risk and makes it more difficult to obtain money for new additions and extensions; it often diverts money that should go to upkeep and renewals to pay dividends on this fictitious stock, thus in time deteriorating the quality of service; it is used as a "blind" to show an apparently low rate of return. If a plant were earning a profit of 14 per cent on a true capitalization of $100,000, public opinion would revolt and demand a lowering of rates, but if the same plant shows only a 7 per cent return on an apparent capitalization of $200,000 there will be fewer protests, and criticism of the rate of return may seem to be without foundation.

Many of the railroads and public utility corporations have been grossly overcapitalized in the past. Shortly after the 1907 stock and bond law was passed the Southern Wisconsin Railway company, which operates the local street-car system in the city of Madison, applied for per-

[1] An examination of all state laws enacted up to Oct. 1, 1913, showed the following states had laws regulating security issues through a state agency: Arizona, California, Colorado, Georgia, Illinois, Indiana, Kansas, Maine, Maryland, Massachusetts, Michigan, Missouri, Nebraska, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Texas, Vermont and Wisconsin.

mission to issue $300,000 of par value serial bonds. Investigation of this company disclosed an example of the system of overcapitalization that existed before regulation. The Commission said in its decision:

On the basis of data in possession of the Railroad Commission,[1] it may be stated that the $685,000 par value of bonds held in trust by the Citizens' Saving and Trust company of Cleveland, Ohio, more than represents the full value of the Madison street railway property; and that neither the $450,000 par value of bonds held by the Madison & Interurban Traction company, nor the $50,000 par value of bonds held by the Southern Wisconsin Traction and Light company, represent any actual and necessary investment in the present Madison street railway system, not to speak of the $815,000 of bonds, par value, authorized to be issued, but not yet issued by the Southern Wisconsin Railway company. In other words, the authorized bond issue of the Southern Wisconsin Railway company equals, approximately, five times the cost of reproduction new of the property upon which the bonds rest, while the outstanding stock may be regarded as a super-bonus for a promoter. In round numbers the bonded indebtedness at present outstanding amounts to $96,000 per mile; total bonds outstanding and authorized $160,000 per mile; while the cost of reproduction new today is less than $31,000 per mile. . . . The capital issues of the Southern Wisconsin Railway company have been shamefully inflated in the past.

Because of these large outstanding issues some companies have naturally experienced difficulties in obtaining sufficient funds to make all necessary extensions. The Commission has had trouble in ordering extensions because of the inability of the companies to obtain additional funds by bond issues. Thus it must be apparent that the main principle back of regulation of stocks and bonds is that capitalization shall equal or closely approximate the amount that has been wisely and economically expended

[1] *In re Southern Wisconsin Railway Co.*, 1907, 2 W. R. C. R., 52.

in the development of the plant. Of course, such legislation is a blow to the promoter and speculator, who bond plants for full value, develop the property to pay profits on excessive capital stock and then unload the plant upon the unsuspecting public.

Of the two methods of stock and bond regulation—strict supervision with a commission authorizing all issues, or an investigation by a commission for purposes of publicity with power to prosecute for violations—the former has been adopted in Wisconsin. The latter plan gives the utility larger discretion in its corporate management.

The Wisconsin law applies to all railroads and public utilities issuing securities payable at periods more than one year after the date of issue.[1] It provides that the purposes for which such securities may be issued are: organization expenses, construction or improvements; the refunding of its legal obligations; raising its stock and bond issues when below the actual value of the property to an amount equal to such valuation and for certain special railroad purposes. No stocks or bonds shall be issued, except in consideration of money, labor or property at its true value as determined by the Commission. Stocks must be sold at par and bonds at not less than 75 per cent of the face value. The law does not recognize the principle of stock issues without monetary value, although this plan is biennially advocated before the legislature and has the approval of Chairman Roemer of the Wisconsin Commission.[2] This principle, however, is as vigorously opposed by Commissioner Erickson.[3]

An attempt is made in the Wisconsin statute to correct the evils due to large bond issues, and small stock issue,

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[1] Sec. 1753-22, Revised Statutes of 1913.

[2] Commissioner Roemer, Address before Southern Gas Convention, Mobile, Ala., Apr. 23, 1914.

[3] Commissioner Erickson, Address at Madison, Wis., Jan., 1909.

which leave the management of the properties largely in the hands of stockholders who have little property interest in the utility. Such conditions lead many times to an unscrupulous management of the properties, with a diversion of funds from their proper uses. To correct this the act provides that the bonds shall bear a reasonable proportion to the stock, leaving the question of ratio to be determined by the Railroad Commission after investigation. Usually about a one-third stock and a two-thirds bond issue, together approximating the value of the property, is allowed, although each case depends entirely on its own peculiar circumstances.

Stocks and bonds can be issued only upon authority of the Railroad Commission. The application made by the railroad or utility sets forth the amount, character and terms of the issue, the purposes for which it is to be used and a complete statement of the financial situation and history of the corporation in such detail as the Commission may require. The proceeds of such issues can be used for no other purposes than those specified in the certificate. The aim of such regulation is to put a dollar's worth of property back of every dollar of securities authorized.

If a utility is reorganized or several utilities are consolidated, a valuation is made by the Commission and the new stock and bond issues shall not exceed the amount of the value fixed. The motive back of this provision is thus explained by Commissioner Erickson:

> Another evil fostered by the unlimited right to issue[1] securities, is the unnecessary and economically unwise consolidation of public utility plants under one management. Consolidations of operating properties are sometimes a very prudent and econom-

[1] Erickson, "Regulation of Public Utilities," *Journal of the Western Society of Engineers*, XVIII, 414.

ical move, but there are times when consolidations are effected with a view solely to profit on the part of those promoting the consolidation and it is schemes such as this that are now referred to. The opportunity to combine two corporations and issue securities exceeding the combined value of their properties, is so tempting that, in the absence of the regulation of security issues, public utility managers have often availed themselves of it in the past, much to the detriment of the public.

In the determination of this value as a basis for security issues the Commission is directed by the statute not to appraise a franchise "at any greater sum or value than the sum paid therefor into the public treasury of the state or the municipality granting the same."

But the power of the Commission extends beyond the authority to permit issues to be made. It is also clothed with the power to investigate how the money received from the securities has been expended and whether it has been used for the purposes specified in the certificate authorizing the issue. Stock, bond or scrip dividends are prohibited, except such as may be authorized by the Commission for the purpose of harmonizing the value of the property and the amount of securities outstanding.

It would seem that in view of the great variation of circumstances under which security issues are marketed, the lawful price of the securities should not be permanently fixed at a single point, but should be subject to designation by the Commission in each case. Thus the market and other conditions existing at the time could be fully recognized in the determination of the price. At present, a 6-per-cent bond is permitted to be sold at as heavy a discount as a 4-per-cent bond, though the rate of interest on the bond should be one of the leading factors in determining the proper amount of discount. In the case of stock, the necessity for some flexibility in the selling price is sometimes even more urgent than in the case of bonds.

On the one hand, a company whose stock is selling in the open market above par should not be allowed to put out new stock at par, since the difference between the par value and the market value constitutes a bonus to the buyer of the new stock. A single example will illustrate. The Chicago, Milwaukee & St. Paul Railway since 1903 has issued about $90,000,000 of common stock to its stockholders at par, when this stock was selling on the exchanges at not far from $200 a share, or double its par value. The preferred stock paid annual dividends of 8 per cent and the common stock 7 per cent. Thus in the past ten years besides the regular dividends the holders of stock have received stock dividends amounting to from 75 per cent to 100 per cent of their holdings. During this time the company was building a new line to the Coast and the money obtained from selling the common stock at par was used for the purpose of new construction. Had there been a national law on the subject compelling the company to sell its stocks at the market price, nearly double the amount of money would have been received for the same securities. Such dealings inflate the cost of the road and the sum total of the company's securities. From the point of view of the investor there are more reasons why stocks should be regulated than bonds. The latter are handled through trust companies, banks and large holding corporations, who see to it that the value is back of the bonds. These issues usually bear a fixed rate of interest. With stocks it is different. Unregulated stocks easily lend themselves to all sorts of unscrupulous practices for which the public must often suffer. On the other hand, in the case of some newly organized companies, the raising of money by the sale of stock at its par value is a very difficult task, and some relaxation from the present rigid price standard may be desirable. Such relaxation should not, of course, go to the extent of sanctioning the issuance of stock as a pure

bonus or without any substantial payment into the company's treasury; but stock, like bonds, should perhaps be subject to such reasonable discounts as the Commission may find to be required by the exigencies of the particular case in hand.

"One of the principal arguments in favor of exempting stocks from regulation is that such exemption is necessary in order to secure the necessary capital for such enterprises and the only way in which promoters can be assured of reaping many profits," said Commissioner Erickson, in answering some of the critics of regulation. "These propositions, however, are not sustained by facts. Experience upon this point shows that the bona fide investor, who in the end furnishes the capital, is much more ready to place his money in public utilities in states which have adopted reasonable systems of regulation than in states where there is no such regulation. In fact, the effect of such regulation is to increase the supply of such investment funds and to decrease interest rates thereon."

Opponents of state security regulation of the kind now in effect in Wisconsin favor the enactment of laws that will merely give such wide publicity to proposed security issues as to nullify any attempts at watering.[1] They also contend that the issuing of securities under such a law as the present Wisconsin law will validate past issues. Upon this ground former Commissioner Roemer, who holds an opposite view from that of Commissioner Erickson, believes that "the English[2] Companies' act is a much

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[1] Thomas Mulvey, Under-Secretary of State of Canada, "Company Capitalization Control," Report on existing legislation in Canada and elsewhere, 1913, XXXV et seq. This volume also contains the report of the Federal Securities Commission and is the most comprehensive presentation of the subject that has come to the author's attention. *See also, La Follette's Weekly* for views of Senator La Follette, Jan. 31, 1914.

[2] *Ibid.*, XXXVII.

wiser measure for the regulation of the issues of corporate securities than any of the laws or proposed measures that have come to my attention in this country."

The argument that strict regulation gives unwarranted approval to past issues that may ultimately embarrass the Commission when a rate question arises is answered by John M. Eshleman, former president of the Railroad Commission of California, who is recognized as one of the leading exponents of the present Wisconsin stock and bond law. After answering many of the objections raised against regulation, he says:

> As regards securities that are approved by the state, under[2] the proper precaution pointed out herein, I can give myself no great concern as to the effect of such approval. If the public utility commission does its duty, the approved securities should be good and if it sees to it that the proceeds are honestly invested in the property and takes care that securities approved are not diluted through participation with other securities not approved, then why should not these securities be recognized in the rates? But regardless of any difficulties that confront those empowered to regulate securities, the condition under regulation is so immeasurably better for utility patron and investor, as far as can now be determined, that I am at a loss to understand the Jeremiah-like attitude of those who some years ago indulged in the same childlike faith in the efficacy of regulation that some of the rest of us now display. But I could the better understand and perhaps agree with those formerly urging regulation and now so fearful of its results, if they would point out wherein it had failed where effectively applied, instead of contending that it may produce results that have not yet come upon us. The evils of overcapitalization are familiar to us all. The logic of regulation seems to me to be irrefutable. When properly carried on it is certainly preferable to the former condition, and until some-

[2] John M. Eshleman, "Control of the Issuance of Securities," *The Annals of the American Academy of Political and Social Science*, LIII, 160.

thing more substantial than mere fears of results that cannot be shown as yet to have materialized is urged against the propriety of regulating securities, such regulation certainly should not be rejected and a reversion to former admittedly bad conditions invited.

A New York court [1] has taken a like view in declaring that the authorization by the Commission does not carry with it guarantee "that the property back of the stock is worth the amount thereof." Chairman Roemer does not consider this decision conclusive.

Under the Wisconsin law the penalty for issuing stock or bonds without authorization ranges from $500 to $10,000. Certificates of preferred and common stock must state on their face the privileges granted to preferred stock and no change or amendment of the company's articles of incorporation with reference to preferred stock can be made without a two-thirds vote of all outstanding stock, preferred and common. Formerly the fee charged by the Commission for authority to issue bonds or notes was $1 for each $1,000 of securities. The 1913 legislature provided a graduated rate which goes as low as 10 cents for bond or note issues over $500,000. There is no fee for stock issues.

A summarization of stock issues by the Commission in the past three years follows:

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[1] *People ex rel. Westchester Street Railway Co.* v. *Public Service Commission of the Second District of New York*, 158 App. Div. 251, 143 N. Y. Supp. 148, decided by Appellate Division of the Supreme Court of New York, July 8, 1913. Extract from opinion by J. Kellogg, N. Y. Supp., 152.

"The authorization by the Commission to an issue of stock does not carry with it the certificate of the state or the Commission that the property back of the stock is worth the amount thereof. It indicates merely that the stock is issued for proper purposes, and, if for property purchased, that it was an honest purchase and for the necessary and proper use of the corporation."

TOTAL STOCK AND BOND ISSUES FOR THREE FISCAL YEARS 1911-1914
"BONDS" INCLUDE NOTES

	Railroads	Public utilities	Combined companies*	Total
Stock, total	$ 7,067,450	$ 5,327,678	$ 5,531,000	$17,926,128
Bonds, total	658,011,200	8,536,917	18,842,000	685,390,117
Total Securities	665,078,650	13,864,595	24,373,000	703,316,245
Stock for refunding	450,000	1,278,475	650,000	2,378,475
Bonds for refunding	361,025,800	1,556,000	7,358,000	369,939,800
Total for refunding	361,475,800	2,834,475	8,008,000	372,318,275
Net amount for new purposes	303,602,850	11,030,120	16,365,000	330,997,970

*Combined companies operating both a street railway and a public utility plant.

Thus far none of the evils threatened under security regulation has appeared in Wisconsin. Capital has entered the field as freely as desired and interest rates have not been exorbitant. Because the Wisconsin law follows the strict regulation method, no attempt will be made to develop the idea back of the theory for less stringent regulation. The footnotes refer the reader to publications where the arguments in support of this view are to be found.

Under a separate statute enacted in 1913 the Commission is given the power to administer the so-called "Blue Sky law,"[1] which regulates the sale of securities of other concerns than railroads or public service corporations. The law exempts all classes of government securities; securities listed on the New York and Chicago exchanges or other exchanges approved by the Commission; securities of Wisconsin banks and other trust companies and of domestic corporations organized with $25,000 capital stock or less. Dealers are required to be licensed by the Commission and

[1] Sec. 1753-48-53, Revised Statutes of 1913.

must furnish complete information to the Commission regarding the securities offered for sale. While the law has done much good, such legislation can never reach its highest efficiency until all other states enact similar statutes. Many concerns evade the law by operating in bordering states and mailing their literature to lists in Wisconsin. Deals consummated through the mails when the operations are directed in another state cannot be reached by such legislation.

Within the state the effect of the law has on the whole been wholesome.

CHAPTER XVII

WATER-POWER LEGISLATION

The placing of the water powers of the state under the control of the Railroad Commission is but an integral part of the conservation movement that obtained impetus in the nation by the calling of the conference of governors at the White House, May 13-18, 1908, and in the state through the appointment of a conservation committee by Governor James O. Davidson in July following. This state committee made an extensive investigation of the subject of water powers, forests and soils. It recommended that hereafter special franchises for water-power development be not granted, but "that a general statute be framed upon the subject and the granting of franchises be given to some Commission." The legislature of 1909, following this recommendation, declined to allow any franchises for water-power development, but appointed a special committee to investigate the subject and draft bills for submission at the 1911 session of the legislature. Water-power legislation now became a subject of vital legislative importance.[1]

[1] There were other factors that contributed largely to the legislative interest in water-power control. In 1910, President Charles R. Van Hise, of the University of Wisconsin, pointed out that at the present time 26,000,000 horse power in the United States is developed by coal, of which according to leading authorities, 15,000,000 horse power could be more economically developed by water, at an economic saving of about $12 per annum, or $180,000,000 a year. He said that for every horse power developed by water ten tons of coal are saved, making it possible to reserve 150,000,000 tons of coal annually, or about one-third of the output

It is not the purpose of this chapter to develop the history of the conservation movement in Wisconsin, except briefly as it applies to the additional duties imposed upon the Railroad Commission by the enactment of the water-power law. Prior to 1907 the legislature had from time to time granted franchises for the development of water powers without charge. Most of these franchises contained the specific provision permitting the legislature to alter or repeal them at any time and many carried the power of eminent domain necessary to overflow lands. The court had sustained the mill dam act of 1840 on the ground that the land flooded by virtue of it was devoted to public use. Dr. Charles R. Van Hise, Chairman of the Wisconsin Conservation Commission, contended that "the fact that the state has granted the right of eminent domain to individuals and corporations would seem to make it reasonable to impose special conditions, including charges for special concessions."[1] Miles C. Riley made a special investigation for the legislative water-power committee and found that of the 665 water-power grants prior to 1907, "224 permits were granted to improve navigation and to facilitate log driving, or both; 227 for hydraulic purposes; 79 to facili-

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in the United States, in addition to the $180,000,000 saved through substitution. As indicating the consolidation of the large water power interests, he quoted Herbert Knox Smith, Commissioner of Corporations, to the effect that thirteen companies control 1,825,000 horse power, or more than one-third of the entire development of the United States. Commenting on the future of water-power control and development in the United States, Dr. Van Hise said: "When a century or two centuries hence the amount of coal has become diminished in quantity, and has become higher in price, none can estimate the importance to the nation of this water power. Certain it is that in the future, he who controls this 100,000,000 or 200,000,000 (estimated possible development) horse power controls the industries of the nation." Such information had a tremendous effect in molding public opinion in favor of the passage of a stringent law. *See* Van Hise, Conservation of Natural Resources, 1910, 118-185.

[1] Van Hise, Conservation of Natural Resources, 159.

tate log driving and for hydraulic purposes; and 63 for other purposes, viz., to feed canals, for pisciculture, to create ponds, to flow cranberry marshes, for the 'public good,' for general municipal purposes, and include 44 grants in which no purpose is specified."[1] Of the total of 665 grants, 326 carried the power of eminent domain, 325 contained provisions permitting the legislature to alter or repeal, and 31 were limited in time.

The state conservation commission found that in 1910, according to Professor L. S. Smith, "the water power developed in the state was 183,106 horse power." Dean E. A. Birge estimated that undeveloped water power for the minimum flow of the year was more than 350,000 horse power, "and the amount which would be available through six months not more than about 650,000 horse power."[2] Thus about two-thirds of the water powers of the state are undeveloped. The number of potential horse power may be increased, however, by the creation of systems of reservoirs at the headwaters of water-power streams. Such systems have been established on the Wolf and Wisconsin rivers.[3] The investigations recently made by the Railroad Commission indicate that most of the larger powers have been developed and that the undeveloped powers are on smaller falls.[4]

Professor Smith's report for the Federal Conservation Commission, May, 1908, shows that of the developed powers in Wisconsin, 43 are used to operate paper mills; 218, flour, grain and feed mills; 45, saw mills and planing mills; 43, electric light and power plants; 22, woolen mills, manu-

[1] Report of the Legislative Committee on Water Powers, etc., 1910, Part I, 5.

[2] Third Biennial Report of the Conservation Commission of Wisconsin, 1.

[3] Ch. 649, Laws of 1913 and Ch. 335, Laws of 1907.

[4] Senators Husting and Krumrey, Special legislative report for an estimate of the pecuniary value of Wisconsin water powers, 12-15.

facturing yarn and carding; 15, machine shops; and one or more each for the manufacturing of brick, bridges, mill elevators, wooden ware, furniture, hubs and spokes, hosiery, nails, beehives, boxes, brushes, sash and doors, cutlery, scales, cotton goods, creameries, linen goods, and the floating of logs. This list of enterprises operated by water power illustrates the important use to which Wisconsin water powers have already been devoted. The earliest development of the remaining powers, consistent with the protection of public interests, as a conservation movement to save the coal and wood supply of the state, is urgent.

Whether the state owned these water powers, or could only control them subject to the terms of the franchise granted, was a mooted question that had never been directly before the supreme court. The water-power interests denied the power of ownership and questioned the right of control. But as the states of North Dakota, Washington, Wyoming, Idaho, and California had declared the use of the energy in falling water in navigable streams to be a public right, a law was enacted by the 1911 legislature predicated on this principle. The state virtually claimed the ownership of all the water powers in Wisconsin, developed and undeveloped, and provided for the issuing of franchises through the Railroad Commission, all grants to be subject to stringent regulation. This act (Chapter 652, Laws of 1911) was immediately brought before the supreme court, which declared it invalid. It held that the right of the riparian owner to use the water of the river on his own land "is unquestionably a private right appurtenant to the riparian land." The court further said:

> Where the ownership of the bank is essential[1] to the construction of a dam or the creation or development of a water

[1] Water Power Cases, 148 Wisconsin Reports, 149-150.

power, the state is as helpless to use, sell or lease such right without condemnation or compensation as the riparian owner is to intrude into the navigable stream without consent of the state. It requires the concurrence of the riparian owner and the state in such case to make the water power efficient and this right of the riparian owner to refuse to concur and stand out for compensation in the case mentioned, is a private property right and often gives to such land its chief value. The state may refuse its permission to the riparian owner to build a dam and may attach conditions to its consent such as the height, strength, mode of construction, etc., of the dam, and perhaps other conditions, but it may not seize upon this right without compensation and use it or sell it or lease it to another. It cannot authorize the use and enjoyment of this right by a person not a riparian owner for a private purpose without condemnation and compensation to the riparian owner. The act in question attempts to deprive the owners of improved riparian land and of the resulting water power and owners of unimproved riparian land with its appurtenant water-power privileges and advantages, of property without due process of law; it attempts to authorize the taking of private property for private purposes; and it attempts to take property without just compensation. The act in question, in the particulars mentioned, is inconsistent with the paramount commands of the state and of the Federal Constitution applicable to the same facts and conditions. Hence, we cannot recognize it as law.

The court had now marked the line of demarcation upon which a new law could be framed. Apparently resolving every possible advantage in favor of the public, a special committee of the senate, with Senator Paul O. Husting as chairman, submitted a new bill to the legislature in 1913, which was enacted after a spectacular fight before committees and the legislature, the water-power interests opposing it at every step. This brief history of water-power legislation in the state, together with the announced attitude of the supreme court, is prerequisite to an un-

derstanding of the provisions of necessity embodied in the 1913 law that is now being administered by the Railroad Commission.

Even in the new law, however, the legislature gave up the claim of proprietorship of the water powers reluctantly. While recognizing the new powers to be developed as public utilities, subject to the same terms as the other public utilities of the state, the law says that "nothing contained in this chapter shall be construed as conferring, creating or admitting, on the part of the state, the existence of any private property in water, or as requiring the state or any authorized state agency, to pay any compensation at any time for water or the use of water taken."[1]

The administration of the water-power law is lodged with the Railroad Commission. Franchises are granted upon finding of facts by that body, a function heretofore exercised solely by the legislature. Specific directions as to the conditions under which franchises shall issue are laid down in the law. This franchise in effect makes future water-power developments public utilities, subject to the same restrictions, as to rates, service, etc., as are applied to railroads and public utilities of the state. Acceptance of the public utility feature of the law by the applicant is coupled with the franchise requirements.

The water powers of the state are divided into two classes—developed and undeveloped. The supreme court decision made it evident that little can be done with the powers already developed, except subjecting them through Commission supervision to the general police powers as to safety, etc. This class is not recognized as public utilities, and is free from regulation in this regard.

Undeveloped powers are again divided into two classes by the statute—those with a possible development of over

[1] Water Powers Act, Ch. 755, Laws of 1913.

250 horse power and those with a development under 250 horse power. This first class, which includes the larger undeveloped powers, is subjected directly to all of the provisions of the Public Utility Law, while the latter class is given a wider latitude of freedom.

Certain control, however, is to be exercised by the Commission over all present and future water-power developments in the state. "For the personal safety and the protection of property from damage," the Commission is to supervise the safety and construction of dams, reservoirs, etc. In recent years the police power of the state seems to have developed in two different fields,[1] both closely associated in the principles involved, though somewhat dissimilar in the ends to be accomplished. The first deals directly with the safety and protection of life and property; the second with the economic problems presented in the regulation of monopolistic enterprises. The first class of regulation has now been extended generally over the business and industrial field, to enterprises that are not monopolistic.

Included in the first and the more general powers of supervision applicable to all water powers are provisions requiring the Commission to gather full data regarding the safety of present developments; the making of a complete hydrographic survey of the navigable streams of the state, including both developed and undeveloped sites; the determination and marking of high and low water levels and the obtaining of records of stream flow. Future dams are to be constructed on sites approved by the Commission. It is also authorized to order the improvement or strengthening of any existing dam and may even draw off the water, if in its judgment public safety requires it. It may

[1] Commissioner Erickson, Unpublished address on the subject of Water Powers before the University Economics Club, Madison, Wis., May, 1914.

order the construction of chutes, flood gates, booms and piers, if deemed necessary to protect the public interests. The breaking of a large water-power dam at Hatfield, which wiped out the business and a part of the residential section of Black River Falls in 1911, is largely the cause for the delegation of these police powers to the Commission for enforcement and prevention of future calamity. The provisions exercised in this section of the law were distinctly approved by the supreme court in its decision of the water-power cases. To defray the expense of this inspection and administration the owner of a dam is required to pay an annual inspection fee of ten cents per theoretical horse-power capacity determined at the ordinary stage of water. The minimum fee is $10 for each single dam.

The second, or public utility field of regulation is applicable only to water powers to be developed in the future and not over powers already developed under legal franchises. This limitation of control would seem to be tempered by the exigencies of the supreme court decision. All who in the future desire to develop water-power property must obtain a franchise from the Commission which is indeterminate in period, "subject to the right of the state or municipality to acquire the property so developed at a price to be fixed by the Commission in the way prescribed in the law."

As before indicated, both the law and the franchise make the future development of a water power a public utility in character and subject to the same restrictions as to rates and service as other public utilities in the state.[1]

Under the provisions of the law where the development at the ordinary stage of water is over 250 horse power the franchise can be granted only to a corporation organ-

[1] This provision was modified by an act of the Legislature in 1915, after this chapter was written.

ized in the manner prescribed in the act, or to a municipality. Where the possible development is under 250 horse power the franchise may be granted to any individual, firm, corporation or municipality. The law is directed in more detail to the larger developments of over 250 horse power. Before the franchise is granted to the corporations, a step that precedes the issuance of a certificate of incorporation by the Commission, the company must have complied with all of the legal requirements of the water-power law and furnished the Commission with complete data and profiles as to the location of the dam; the nearness to other cities or villages and how they will be affected; the amount of power to be developed; the names of the riparian owners to be affected with the flowage privilege and how navigation will be improved by the structure. If the Commission, after a hearing, finds that the development will improve navigation and will not endanger the interests of the public, the franchise issues. The acceptance of a franchise by an applicant carries with it the twofold obligation to submit to regulation as a public utility, and second, the acceptance of the provision that it will sell its properties to the state or municipality under the terms described in detail in the law. These corporations are also made subject to the Wisconsin stock and bond law. The smaller powers, while obtaining their franchise from the Railroad Commission, are not subjected to the public utility provisions as to rates and service. At the present time the state has not the right to own and operate water powers. A constitutional amendment to accomplish this is now pending.

Water-power corporations organized in the future, with a possible development of 250 horse power or more, must maintain the uniform system of accounting prescribed by the Commission and submit for its approval all expenditures for property and construction "except to such property as they may acquire by eminent domain. These ex-

penditures for property and construction are required to be reasonable."[1] There are further restrictions extended to the larger powers, and not imposed on the smaller ones. All contracts for the sale or delivery of power must be submitted to the Commission for approval before they shall become effective. These contracts are limited to a period of thirty years from the date of franchise, unless extended an additional ten years by the Commission. At the expiration of these contracts the state shall have the right to divert the sale of the current, which the company may have been selling outside of the state, to points within the state reasonably near the development plant. In the case of municipal plants the statute limits the contracts to a term of not over fifteen years. It should be pointed out, however, that the amount of power generated is not the criterion as to whether the power is in the higher class and subjected to the stronger regulation. The possible development at an ordinary stage of water determines the class, and even though the amount developed may be actually less than 250 horse power, it must be organized in the higher class.

Different provisions are also made for the two classes of powers in the matter of acquisition by the state or municipality. In the case of the developments under 250 horse power these may be acquired at any time by the state or municipality at a "just compensation" to be fixed by the Commission, excluding any value for the franchise. In the case of the larger powers, if the purchase by the state or municipality takes place within thirty years of the date the franchise is issued, the rule of compensation applies, allowing nothing for franchise value, just as in the case of the smaller powers. If the purchase occurs after the thirty-year period the method of valuation is described

[1] Erickson, Address on Water Powers, *supra*.

by the statute in detail. It provides that the price paid shall consist of the cost of reproduction of dams and other improvements in the physical condition at the time of acquisition, and the value of lands at the time the franchise was granted. This value is ascertained by the Commission before the franchise is granted to develop one of the larger powers. "At the same time it must determine the value of the power site and in case of acquisition after thirty years no franchise value shall be allowed or any value because of the availability in connection with water power." Under the plan franchise value and unearned increment are excluded, if the state or municipality exercises its option to take over.

The legislature was careful to differentiate the two methods of valuation, whether before or after thirty years. If the valuation is made before the thirty years have expired, the Commission must determine "just compensation," which includes bona fide investments that may have disappeared. After thirty years the Commission must determine the reproduction cost at the time of the taking. In the terms of the franchise the grantee agrees after a lapse of thirty years to sell on the terms set forth in the law. Powers may be purchased within thirty years at any time upon a year's notice, and at any time after thirty years. In case the properties of a larger power may have been subjected to "extraordinary calamity occurring at any time within thirty years after the date when such franchise becomes effective, and causing a damage in excess of twenty-five percentum of the total value of all dams, works, buildings or other structures and equivalent used and useful under the franchise, as determined by the Commission, on application and hearing, the period of thirty years herein provided for the acquisition of the property by the state or any municipality under the terms herein specified, shall be extended for such additional period as may be

equivalent to such fraction of thirty years as such damage shall bear to the total value."

Other sections of the law provide that public utilities already operating water powers may come under the new law and obtain a new franchise, and that water powers operated without a franchise will have to come under the law and take out a franchise as though their developments were not in existence. Otherwise these powers may be abated as a nuisance. To determine how many unauthorized developments there are the Commission is directed to ascertain the legal status of all powers operating in the state and to report the facts to the legislature.

The tremendous work imposed upon the Commission by this law cannot be expressed in mere figures. Every water route in the state is now being surveyed and its power computed, even if it is only sufficient to operate a small grist mill. This is an expensive undertaking. The condition of the already constructed dams is being investigated to determine their safety. The flow of the streams at all seasons of the year is also a subject of investigation. These alone are enormous and costly engineering tasks that must be revised annually as conditions change. Before franchises can be granted to any general extent much of this information must be furnished the Commission.

Two applications have already been made for developments under the law and there is correspondence that indicates that many more are informally pending. How valuable these powers are to become depends largely upon their cost of operation, and perhaps inventions in other fields. At present about 20 per cent of the energy in coal is utilized in steam-power development. Inventions increasing this energy two or fourfold may be possible, and the use of water power as an energy developer would then be correspondingly decreased, provided coal does not become correspondingly expensive.

"Whether water powers are profitable or not depends very largely upon the cost of the improvements that are necessary, the flowage, or amount of water available at all times, and the market for electricity," declares Commissioner Erickson.[1] "When the cost of the improvements can be kept below $150 per developed horse power, when the flowage is steady enough to keep the cost and use of auxiliary steam plants down to a minimum and when there is a market at normal prices for at least from one-third to one-half of the total possible output of energy, then water powers may be worth a great deal. When on the other hand the cost of the improvements exceeds the above figures; when because of low water or for other reasons the steam auxiliary plant must be relatively large and subject to frequent and interrupted use; when there is but a limited market for the current, then the cost of current generated by water is often greater than the cost of current generated by steam."

That this law safeguards public interests that have been unseen or ignored in the past goes without question. It may prove a serious handicap to the "plunger" and the speculator. It is framed to protect the bona fide investor, and to safeguard the more important interests and rights of the public. As water powers are the result of elements spread over a large territory converging at one point, the direct interest of the state would seem to be paramount, in dealing with this question, to that of a selfish private interest. It is this fact that prompts the treatment legally of the new water-power developments as public utilities.

[1] Erickson, Address on Water Powers, *supra*.

CHAPTER XVIII

IMPROVEMENTS IN SAFETY AND CONVENIENCE OF RAILROAD SERVICE

In the mind of the general public undue importance is often attached to railroad rate reductions and too little credit is given for service betterments. This is because the latter more often touches the needs of a specific community instead of the state as a whole. No citizen will object to a rate reduction. Many will oppose a change in service that goes counter to their ideas or that may hamper them personally, regardless of the benefits to the majority of a community. An illustration of this is found in an early order of the Commission permitting the Illinois Central road to operate a gasoline passenger car on its line.[1] Commenting on the opposition to this change in service the Commission said:

> The opposition which appears to have developed against the use of the motor car on the Freeport-Madison line is only another illustration of the peculiar fate which has befallen all important developments in the methods and means of transportation. When the first important English railway was being considered by parliament, strenuous objections were made against the granting of the charter, for the reason that the introduction of the railway would destroy the value of the landed estates, that it would disturb game, that the smoke of the locomotive would blight vegetation, that hens would cease to lay eggs, that the value of real estate in the vicinity of stations would be depressed, that it would

[1] *Wright* v. *Illinois Central Railroad Co.*, 1908, 2 W. R. C. R., 279, 289.

be extremely dangerous to ride at the terrific rate of thirty miles an hour, and that in general it would be much better for people if they would be content to continue to ride in stage coaches and canal boats.

When the first German railway was being seriously considered, so much opposition developed that the question of the influence of travel on the railway was submitted to a distinguished medical authority. This gentleman, after due consideration, submitted a report in which he expressed it as his opinion that the probable effect of railway travel would be extremely deleterious to the health of those who would look on as well as ride in moving cars. The disease, which he believed the introduction of the railway would spread, he designated by the term *delirium furiosum*. He thought that if the people would be foolhardy enough to ride in cars they might be deserving of little pity if they should contract this terrible disease, but in his judgment it was the duty of the state to protect the onlookers, and with a view of affording this protection he recommended the construction of a high and closely fitting fence on both sides of the track.

The service work and accomplishments of the Commission fall into two natural classes: (1) convenience of service; (2) safety of service.

The former deals with such problems as the stopping of trains, additional service requirements, sidings for warehouses, improved station facilities and new depots, sanitation of cars and stations and car shortages; the latter deals with crossing protections, the elimination of dangerous grades, safety of roadbeds and bridges, and other questions that in the ultimate tend to protect both property and life.

One commissioner devotes practically all of his time to service cases. As inspectors travel over the state reports are made on all dangerous crossings and the lack of conveniences to the traveling public. These matters are brought to the attention of local authorities. Upon complaint they are made the subject of hearing and investigation, unless the improvement is ordered voluntarily upon

suggestion to the railroad from the Commission. Where a community neglects to make formal complaint the Commission may take action on its own motion. Almost two-thirds of such complaints are settled informally. In other cases formal orders are made requiring the stopping of trains at small stations and close connections at junction points. During the calendar year 1913, twenty-six formal cases of this character were considered by the Commission. Ten were satisfied without a formal order, seven were settled by formal orders requiring additional service, six were dismissed and three were pending at the close of the year.

Dilapidated stations have been replaced. Inadequate freight and passenger depots have been ordered enlarged. Out of thirty-four formal station cases considered during 1913, nine were satisfied without a formal order, sixteen were granted new stations or alterations in station equipment, and eight applications, chiefly petitions for an agent at stations already provided with shelter, were dismissed. One case was pending at the close of the calendar year. The cost of erecting these new stations varied from $400 to $15,000, depending on the population of the community to be served. Over $120,000 has been invested in station improvements under orders of the Commission.[1]

Since this class of service work was begun by the Com-

[1] On the Chicago & Northwestern Railway new stations have been built in compliance with orders at Allenville, Clintonville, Whitefish Bay, Plymouth, Lohrville, Allis, Ripon Jct. (Jt. Sta.); on the Chicago, Milwaukee & St. Paul Railway new stations have been built in compliance with orders at Okauchee, Duplainville (Jt. Sta.), between Kilbourn and Portage, Ripon, Stoughton, Delavan, Plymouth, Schleisingerville (Jt. Sta.), Ripon Jct. (Jt. Sta.); on the Minneapolis, St. Paul & Sault Ste. Marie Railway new stations have been built in compliance with orders at Abbotsford, Medford, Polly, Quarry, N. Fond du Lac, Weyauwega, Catawba, Hillsdale, Amery, Almena, Duplainville (Jt. Sta.), Schleisingerville (Jt. Sta.); on the Chicago, St. Paul, Minneapolis & Omaha Railway new stations have

mission orders for the erection of seven new stations at an aggregate cost of $30,164 have been complied with by the Chicago & Northwestern Railway; eight on the Chicago, Milwaukee & St. Paul road at a cost of $32,599; twelve on the Minneapolis, St. Paul & Sault Ste. Marie road at a cost of $20,792; two on the Chicago, St. Paul, Minneapolis & Omaha road at a cost of $3,420; two on the Green Bay & Western at a cost of $1,035, and one platform and shelter shed on the Great Northern system at an expense of $156. One order has been made for a union depot.[1]

Miscellaneous improvements, such as side tracks and platforms, lights in stations, sanitary toilets, shelter sheds, team tracks and other conveniences have been the subject of fifteen orders on the Chicago & Northwestern system, the cost of these betterments aggregating $8,564; fourteen orders on the Chicago, Milwaukee & St. Paul at a cost of $17,362; four on the Minneapolis, St. Paul & Sault Ste. Marie at a cost of $1,060; two on the Chicago, St. Paul, Minneapolis & Omaha lines at $1,957 expense; one on the Northern Pacific at a cost of $331; one on the Chicago, Burlington & Quincy at a cost of $1,361, and one on the Chicago & Milwaukee Electric Railroad at a cost of $330.

Several orders have been made for the construction of spur tracks to industrial plants. Sanitation on trains and at depots is the source of constant inspections and improvements through informal conferences. Even free paper drinking cups must be furnished on all trains for the convenience of the traveling public.[2]

The car shortage evil has been met and practically

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been built in compliance with orders at South Range, Cobban; on the Green Bay & Western Railroad new stations have been built in compliance with orders at Forestville and Meehan; on the Great Northern Railway a platform and shelter shed have been built in compliance with orders.

[1] *Howard Teasdale* v. *C. & N. W.* and *C. M. & St. P.*, R 1416.

[2] Sec. 1416-13m (Ch. 750, Laws of 1913) Revised Statutes of 1913.

solved by the Commission's constant supervision. Through letters to shippers and warnings to the public the bulk of the lime, cement, lumber and coal shipments are all moved before the crop season is at hand. Shippers are advised to unload cars as rapidly as possible that they may be immediately returned to the service. Freight movements, the number of loaded cars and their location at different points of the system are made the subject of daily reports when the crops begin to move. During the rush season shippers are asked to report delays in securing cars immediately to the Commission. One man at the Commission is in constant communication over the long-distance telephone with the traffic managers of the different roads directing train movements. Those who would ship perishable produce such as cabbage and fruits report the date cars will be needed several days in advance, with the result that since the organization of the Commission the stringency and losses through car shortage have been kept at a minimum.

The safety service improvement work of the Commission has also been marked by accomplishments. The economic waste occasioned by deaths and accidents due to railway operation is appalling.

In the United States in 1914, 165,212 employees and 15,121 passengers were injured; 3,259 employees and 265 passengers were killed; 6,438 other persons were killed and 10,687 injured—a toll of 10,302 killed and 192,662 injured in a single year. Statistics gathered by the Interstate Commerce Commission show the following classified railway accidents in the United States for the year ending June 30, 1914.

Over 50 per cent of those killed in all railway accidents in 1914 were reported as "trespassers."[1] The record of

[1] Interstate commerce statistics class persons stealing rides as "trespassers"; the Wisconsin statistics do not.

TOTAL RAILWAY ACCIDENTS, YEAR ENDING JUNE 30, 1914

	Killed	Injured
Train accidents:		
Passengers	265	15,121
Trespassers	5,471	6,354
Employees	2,850	51,938
Other persons	1,307	5,975
Total	9,893	79,388
Industrial accidents to employees	409	113,274
Totals	10,302	192,662

grade-crossing accidents, injuries and deaths due to trespassing in Wisconsin for the fiscal years 1912 and 1913 shows eighty-seven persons killed and one hundred and ninety-six injured on crossings compared with two hundred and forty-eight "trespassers" killed and one hundred and twenty-three injured. No effective legislation has been enacted in Wisconsin to lessen the number of deaths and accidents to "trespassers." Measures to fix a nominal fine for trespass on tracks have been repeatedly defeated.

That accidents are fewer at protected crossings and that the Commission is justified in ordering all dangerous crossings protected is indicated by the records of deaths and accidents on all railroads of Wisconsin for the fiscal years 1912 and 1913. For the two years seventy-four were killed and one hundred and sixty-nine were injured at "unprotected" crossings, compared with thirteen killed and twenty-seven injured at "protected" crossings.

Nearly 1,000 people are annually killed in the United States on highway grade crossings[1] and in two years, 1912 and 1913, seventy-four were killed and one hundred and sixty-nine were injured on unprotected crossings in Wisconsin. Through proper precautions many such accidents could be avoided. It was this problem that the legislature

[1] Dunn, "American Transportation Question," 171.

RECORD OF GRADE-CROSSING ACCIDENTS, INJURIES AND DEATHS DUE TO TRESPASSING IN WISCONSIN FOR YEARS 1912, 1913, 1914

	1912		1913		1914	
	Killed	Injured	Killed	Injured	Killed	Injured
Trespass....	111	31	137	92	141	112
Unprotected crossings..	41	77	33	92	9	40
Protected crossings:						
Bell....	3	5	3	6	2	13
Flag....	3	4	0	4	3	6
Gates...	0	0	4	8	4	5
Total, exclusive of trespassers....	47	86	40	110	18	64

sought to deal with in 1909, when it enacted the highway crossing law placing its administration with the Railroad Commission.

Shortly after the introduction of the steam railroad into the economic life of the state the legislature enacted a law which required that every railroad should restore streets, highways, canals or streams crossed by it "to such condition" that their usefulness "shall not be materially impaired." This statute, copied from New York and enacted in 1872, is merely declaratory of the common law and as construed by the supreme court has no application to a highway built after the construction of a railroad which it crosses. It related principally to new railroad construction and the maintenance of crossings after the construction had been completed. This law was found to be insufficient to meet new conditions arising after a railroad had been constructed and was in operation.

To meet such situations the legislature in 1887 passed

a law which provided that the grades of highways and railroads at crossings be constructed by voluntary agreement between the supervisors of a town, the trustees of the village, or county board. The cost was to be apportioned by agreement between the railroad and the town, village or county, as the case may be. It was almost impossible, except in extreme cases, to get action under this law. No agreement could be reached over the apportionments. The legislation of 1909 makes effective the provisions of the latter law by empowering the Railroad Commission to compel the separation of grade crossings and apportion the cost of the work. This statute includes not only towns, villages or counties, but cities as well.[1]

Although dangerous crossings and accidents on them were the source of constant complaint, the Commission had no authority prior to 1909 to deal with crossings to compel a separation of grades. To meet this condition a conference of railroads, representatives of municipalities and others interested in the matter was called and a bill was drafted. The statute as enacted and amended gives the Railroad Commission complete power to direct the character of the grade separation, the straightening of highways near crossing, or their relocation, and an apportionment of the expense between the railroad and the town, village or city. This law has since been adopted in other states. It has been upheld by the supreme court.[2]

There has been a slight opposition to this legislation from some of the larger cities of the state, which believe that the Commission should have the power to order the separation, but that the entire expense of the improvement should be placed upon the railroad. Such a change would deprive the Commission of the power to apportion the cost

[1] Sec. 1797-12d, Revised Statutes of 1913.

[2] *Town of Polk* v. *Railroad Commission of Wisconsin*, 143 Wisconsin Reports, 191.

of making separation of grades. This proposed legislation has been defeated by the legislature on the ground that the cities were partly responsible for the need of separation.

The direct benefits to a city derived from the elimination of grade crossings are:

1. Safety of vehicles and pedestrians using the streets is enhanced.

2. Great delay in street traffic, which in large cities would be a tremendous economic waste, is eliminated.

3. It removes the delays of fire trucks that have been the cause of property losses because of inability to reach the fire in time to check it.

4. The blockade of street railway traffic at grade crossings is eliminated. It permits the development of a transit service that carries population out further, reducing congestion of population, and inconvenience in travel.

When the railroads were originally constructed there was no necessity for grade separation, but as the city expanded these outlying thoroughfares became more and more important until heavy street traffic required public protection. Moreover, the most expensive grade separations are in cities and to place the burden entirely upon the railroad would be to shift the burden back upon the people of the state. As a result those who benefit directly from the improvement may pay little or nothing for the improvement, while those who live outside the cities and contribute the bulk of the traffic must bear an unjust expense of improving the cities of the state. If the burden is entirely placed upon the railroad company, the railroad must place it back upon the shipper. The farmer who ships his stock or grain to market, the lumberman who ships his forest products or manufactured goods, the miner who ships the product of his mine, must contribute to the improvement, while those who enjoy the increased value

of lands resulting from it may go entirely free of the burden.

Grade separations in country districts are comparatively inexpensive when compared with the expensive viaducts, steel and concrete structures that are required in the cities. The recent separation of grades of the northern division of the Chicago, Milwaukee & St. Paul road into Milwaukee will cost upwards of $6,000,000. Taken as a whole the crossing orders of the Commission place from 70 to 90 per cent of the expense upon the railroad and the balance is borne by the community.

In no state in the union has so systematic an endeavor been made as in Wisconsin to protect dangerous crossings. Improvements of this character have been made on all of the roads of the state but the work on the two principal roads will be taken as illustrative of the nature of the improvements.

Orders made by the Commission for crossing protection on the Chicago & Northwestern road up to January 1, 1914, provided for forty-one automatic electric alarms, six grade separations, three improvements to existing separated grades, seven crossings improved by grading or removal of obstructions to view, one crossing relocated, three crossing gates, improved paving over four city crossings, five crossings involving minor repairs, also the services of twenty-two additional gatemen or flagmen, of which number, six were required for temporary protection at Milwaukee pending grade separation. Two new crossings were opened. Track and roadway improvements cover the complete remodeling of one interlocking plant, the installation of one railway crossing gate and one new track culvert.

On the Chicago, Milwaukee & St. Paul system in this state the improvements under separate orders of the Commission provide for fifty automatic electric alarms, four electric gongs, three crossing gates, three grade separa-

tions, two crossing relocations, nine crossings improved by grading or removal of obstructions, two bridges repaired, and other minor improvements.

A summary of the totals for all the roads shows that $196,564 was actually spent in crossing work to January 1, 1914, all but $130 of which was spent directly for protection. The annual wage expenditure for flagmen and gatemen was $24,125. Yet these figures do not include the large expenditures now being made in Milwaukee for track elevation.

Under a law enacted in 1913 the Commission has ordered the change of the route of public highways in several instances to secure a less dangerous approach.[1] Wherever wrecks or accidents occur the Commission makes an investigation to determine the cause and to institute such protection as will eliminate future dangers. The roadbeds of the systems, interlocking switches, block signals and fences along the route are under regular inspection, and improvements are daily suggested. At times in cold winter weather the Commission directs the speed at which trains may be operated over the lines. All trains must carry medical supplies, such as tape, cotton and bandages for use in case of accidents.[2] By eliminating the causes of accidents and wrecks, caused by dangerous crossings, grades and roadbeds, it is hoped to reduce the toll of property destroyed and men killed and injured to the low percentage now reached in some of the European countries.

Every encouragement is given by the Commission and its engineering staff to the formation of safety organizations among railroad employees. The "committees of safety" organized on the Chicago & Northwestern line by

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[1] *Town of Almena* v. *C., St. P. M. & Omaha Ry. Co.*, 1914, 14 W. R. C. R., No. R-835; *In re Investigation C., B. & Q. R. Co. Crossing near Crossville*, 13 W. R. C. R., 1913, No. R-757.

[2] Ch. 469, Laws of 1913.

Ralph C. Richards, which in twenty-eight months[1] reduced the death toll on the entire system 179 or 22 per cent and the injury roll 6,447 or 27 per cent by means of conferences among employees, is urged and aided by the Commission on all of the other lines operating in the state.

[1] *American Magazine*, Dec., 1913, LXXVI, 45.

CHAPTER XIX

SOME ACCOMPLISHMENTS IN HANDLING RAILROAD RATES

According to a recent change in the law no rate can become effective without the approval of the Commission. A striking example of the benefit derived from this provision, when applied to the thousands of rates the Commission must pass upon annually, is seen in what is known as the Milwaukee switching case. The Chicago, Milwaukee & St. Paul Railway filed with the Commission a tariff proposing a change from a flat rate of $5 per car for transportation within the switching limits of the district to a minimum of $9 per car. The Commission did not give approval to the change as proposed, nor allow any change until after it had made a thorough study of the situation, requiring more than a year. It would be difficult to estimate exactly the amount saved the Milwaukee patrons of the company, but it was considerable. It is worthy of notice that since the approval of the Commission became essential before a change of rate could be made, the tariff department has passed on changes involving upwards of 100,000 rates. The rates upon which increases have been sought relate to a variety of commodities, including sawdust, lumber, drain tile, overalls and duck coats, asphalt and asphaltum, advances in the rates on malt, cucumbers, beans, fish boxes, pulpwood, charcoal, buckwheat, rye and flour and scores of other commodities of which these are but typical examples. It is evident that rates would have

been increased on many classes of shipments had it not been for the hand of a regulatory body. It is a conservative estimate, however, that should regulation be done away with, the corporations now under supervision would take from the people in the first year after the abolishment of regulation, a sum in excess of $5,000,000 in increased rates.

Almost as soon as the Commission was created it began, either upon complaint or upon its own motion, an investigation of freight rates affecting the more important commodities and necessities of life. Reduction in grain rates made the first year after the creation of the Commission, compared with those in effect before regulation, when applied to crop shipments from different localities in the state, amounted to an annual saving of approximately $600,000. Other important commodities affected by reductions are coal, cord wood, pulp, milk, cream, cheese, ice, slab wood, lumber, crushed stone, sand, gravel, brick, tile, livestock and other commodities too numerous to mention. These reductions vary from 1 to 20 per cent; some include the entire state, others only shipments on one line of railroad. It has been estimated that the aggregate savings to the patrons of the carriers arising out of orders of the Commission and the enactment of the two-cent fare law amount to $2,400,000 per annum in railroad charges alone.

In several instances the Commission has taken cases upon appeal to the Interstate Commerce Commission. Acting as petitioner in one case it secured a 20-per-cent reduction in cheese rates. It was active as petitioner in both the express and western classification rate cases. In the former case the Commission's computations involved the consideration of at least one million "basing rates"; the final decision required 130,000 separate rate computations to place the federal and state decisions in accord. This decision saves the Wisconsin public approximately

$100,000 annually over the rates in effect before. The reductions varied from 1 to 30 per cent.

Because over 7,000 different rates are listed in the western classification schedule and nearly 1,000 changes or additions to the classification are made annually for interstate shipments, the handling of these schedules is complicated. Much of the correspondence of the Commission is over rate matters.

Under a law enacted in 1913 the Commission is given power to investigate freight and express bills. It provides for the small and irregular shipper the same benefit that accrues to the large shipper allied with a traffic bureau, and does it without cost to the shipper. This feature of the Commission's duty is daily becoming more useful to more and more patrons of the steam railroads and the express companies. Under the railroad law the Commission is also given power to order refunds for overcharges made to shippers. This results in many thousands of dollars being returned and a more careful attention to tariffs by the local shipping clerks.

It should not be inferred, however, that the accomplishments of the Commission should be measured by reductions in rates alone. It is as much the province of the Commission, and should be included among its accomplishments, if in the interests of justice and equity, rates are increased when found to be unreasonably low. While the reductions in rates have thus far exceeded the advances allowed, increases have been granted in many instances. The spirit of fairness which has characterized the action and orders of the Commission in railroad matters, and which has earned for it the confidence and good will of railroads and shippers alike, is perhaps its greatest accomplishment and the one it was especially created to establish.

CHAPTER XX

STATE CONTROL OF MUNICIPALLY OWNED PLANTS

Municipal ownership attains its highest efficiency under state regulation. The stimulus engendered by comparison with privately owned enterprises develops its greatest usefulness. This class of utilities in Wisconsin is subjected to the same rules and regulations as private plants. There is a common misconception, however, that municipal utilities should not be supervised by the state. No doctrine could be more fallacious. The idea of non-regulation of municipal plants seems to be anchored in the belief that the principal duty of a regulating body is to limit the profits to a reasonable return upon the investment, and this element having been eliminated by municipal ownership the need of further control is unnecessary. Such an idea is based on a false premise.

Customers of municipal plants need protection as to rates and service, as well as those served by private utilities. A plant may have little or no net returns, and yet the rates as a whole for different classes of consumers may be unreasonable or discriminatory. One class of customers may be charged rates so high that they will be contributing a part of the cost of the service rendered to some other class. Again the plant may be extravagantly or inefficiently operated, as a scientific cost analysis and comparison with other plants under state regulation will disclose.[1] The

[1] *See* Ch. VI for a table showing the comparative costs for each step in the operation of municipal water plants in the state.

result under such circumstances may well be that nearly all classes are paying excessive rates and the plant losing money. Rate of profits is but one factor to be dealt with in the field of regulation. The building of equitable schedules of rates, so that each consumer will, as nearly as practicable, be required to meet his proper share of the expenses of the utility and the attainment of adequate service, is equally important. Regulation to be effective must discover and eliminate these inequalities. It is a task that municipal plants are seldom able to accomplish efficiently without the aid of state experts.

No telephone utilities in Wisconsin are municipally owned. The gas and electric plants in the larger cities are also under private ownership. Wisconsin has, however, 179 municipal plants with properties valued at $16,460,594 compared with 162 private utilities in the same classes, with valuations aggregating $15,616,232. The accompanying table [1] gives a financial comparison of the municipal and private plants in the state. It is the smaller utilities unable to hire experts who request the most aid from the state. Does it seem a reasonable public policy that the state should deny this needed service to so large a class of municipal utilities?

Evils exist under both systems of ownership. The records of complaints before the Commission form a safe criterion. Out of forty-four formal cases relating to municipal plants, fifteen involved the reasonableness of existing

[1] For this table the classification of plants was made on the basis of population in which the utility was located: Class "A" in cities over 10,000 inhabitants; Class "B" in cities between 3,000 and 10,000; Class "C" between 1,500 and 3,000, and Class "D" between 500 and 1,500. Utilities in cities below 500 are in "condensed" class. On July 30, 1913, the basis of classification was changed to a combined revenue and population, in the belief that revenues make a safer criterion of the extent of accounts that a utility should keep.

Wisconsin Utilities Showing Classes Containing Both Private and Municipal Plants for Fiscal Year Ending June 30, 1912

Number by Classes	Private	Municipal	Investment		Total Operating Revenues		Total Operating Expenses	
Class			Private	Municipal	Private	Municipal	Private	Municipal
Electric B	41	14	$3,286,679 09	$718,971 08	$950,362 88	$221,397 60	$756,624 27	$161,509 81
Electric C	81	46	1,516,541 86	726,863 16	362,700 35	236,950 13	308,926 51	208,428 71
Water A*	10	11	7,566,689 62	4,002,318 19	635,194 15	415,025 58	333,565 82	229,207 63
Water B	9	32	1,434,453 00	2,416,002 71	140,845 60	287,643 69	79,111 34	189,251 53
Water C	6	62	457,435 19	1,274,756 70	61,760 33	156,862 46	36,233 20	139,535 00
Heating	13	1	1,340,384 10	10,752 95	311,945 00	2,151 44	266,099 61	2,575 23
Gasoline and Acetylene	2	11	14,050 00	72,880 97	2,649 03	27,426 73	2,065 42	33,586 97
Total above	162	177	$15,616,232 86	$9,222,545 76	$2,465,457 34	$1,349,457 60	$1,782,626 17	$964,194 97
Milwaukee Water Works	....	1	.....	7,238,049 17	.....	991,848 79†	.....	309,174 37
Grand Total	162	178	$15,616,232 86	$16,460,594 93	$2,465,457 34	$2,341,306 39	$1,782,626 17	$1,273,369 34

* Milwaukee Water Works excluded.
† Revenues cover period of 15 months.

rates. Of sixty informal cases handled during the three fiscal years ending June 30, 1912, nearly all involved questions of service, inefficient operation or rate discriminations. In the determination of equitable rates the question of cost analysis is of primary consideration. Its importance has been considered in the discussion of accounting and in the following chapter on the defects of local regulation. Aside from complete records of a plant's operating costs, it is necessary to have similar statistics gathered on the same basis from other plants, for comparative purposes. These data can be secured only through a system of state supervision. It is through such methods that abnormal operating expenses are eliminated and strict business methods enforced. Every reason exists why these same records should be obtained from municipal plants. It makes the managements more efficient and insures a better character of service to the public.

A municipal plant renders two distinct classes of service: (1) public, and (2) private. If the city pays nothing for its service, or if it does not pay its proportionate share, as was discovered by the Commission in some cases when the utilities law was passed, this is a discrimination in favor of the taxpayer. If the private service rates are too low, the taxpayers are discriminated against in being compelled to make up the balance. It is but fair that each class should shoulder its own burden, and that each individual consumer should pay as nearly as it is practicable to determine his share of the cost of operating the plant. The discriminations in rates that existed when state regulation was inaugurated were prevalent in municipal as well as private plants.[1] The complaints that have since been received from taxpayers, consumers and city authorities indicate that the public has come to realize clearly that

[1] For further data on discriminations when the Wisconsin utilities law became effective, *see* Ch. XXI.

rates for municipal plants should closely adhere to the cost of the service.

Rates to be charged by municipal plants are computed on the same principles and methods as are used in determining the reasonableness of rates in private plants. Accurate operating records, comparative cost figures, and an unprejudiced view of local conditions are essential.[1] The reasons why the municipality cannot secure these records independently of a state commission are so fully discussed in the following chapter that no discussion of them will be attempted here. Every argument that obtains for state regulation, instead of local regulation, has the same force in considering the question of the state regulation of municipal enterprises.

One of the most tedious tasks that has been imposed upon the Commission has been to impress upon the managements of municipal utilities the desirability of accurate financial records of plant operation, kept on a uniform basis. Before inequalities can be eliminated this is indispensable. That these inequalities do exist[2] is well illustrated in the case of the Cumberland Municipal Electric Light Plant, in which the Commission said:

The applicant in this case desired to increase certain[3] of its present rates for electric current, on the ground that these rates are inadequate and did not cover the cost of furnishing the service

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[1] W. C. Reyer of the Commission's staff has prepared a brief (unpublished) on the need of state regulation of municipal plants which has been freely consulted in the preparation of this chapter.

[2] Among cases illustrating typical rate inequalities in municipal plants are *In re Application Greenwood Municipal Electric Light Plant*, 1910, 6 W. R. C. R., 60; *In re Application City of Madison for Authority to Equalize Its Water Rates*, 1909, 3 W. R. C. R., 299; and *In re Application Bruce Water & Light Commission*, 1912, 9 W. R. C. R., 474.

[3] *In re Application Cumberland Mun. El. Lt. Plant*, 1909, 4 W. R. C. R., 214.

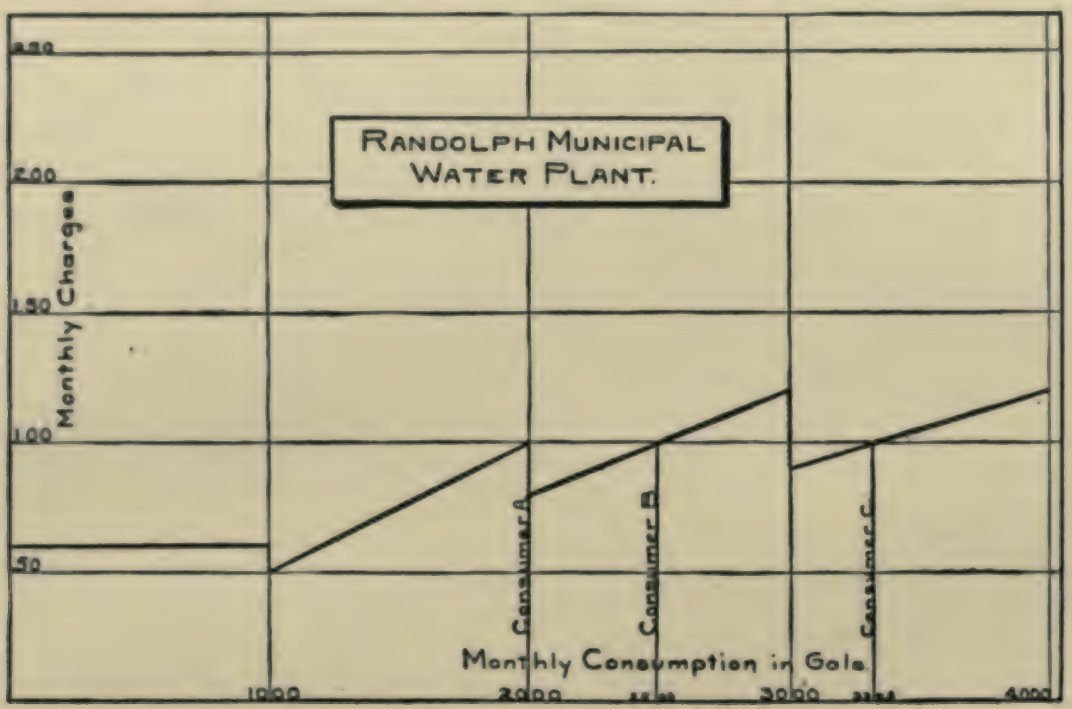
involved. Upon hearing and investigation it was found that the applicant's rate schedule was not properly adjusted and that certain classes of consumers paid less than their just share of the cost of operating the plant. Because of these facts the Commission endeavored to compute more equitable schedules of rates, and has authorized the applicant to put these rates into effect.

Even where the managers of the municipal utility have formulated their own rates and sent them to the Commission for approval, the schedules on examination have been found to be regressive or discriminatory. The following water rates submitted by the village of Randolph, January 20, 1913, are typical:

1,000 gallons or less per month,	$.60 per thousand gallons
1,000 to 2,000 gallons per month.....	.50 per thousand gallons
2,000 to 3,000 gallons per month.....	.40 per thousand gallons
3,000 to 4,000 gallons per month.....	.30 per thousand gallons
Minimum charge, $7.20 per year	

The effect of this schedule is illustrated by the accompanying diagram. A glance will show that consumers using different amounts of water are charged the same sum. Consumers "A," "B" and "C" using 2,000, 2,500 and 3,325 gallons of water respectively pay $1 per month. When "A" consumes 2,000 his rate is 50 cents per 1,000 gallons or $1. If he uses 2,100 gallons his rate is in the group that pays 40 cents per 1,000 gallons and his charge would then be 84 cents. By consuming 100 gallons more he is able to reduce his bill 16 cents. Such rates lead to wastefulness.[1]

[1] Other municipal water plants that have submitted rates to the Commission for approval are Merrillan, Middleton, East Troy, Augusta, Johnson Creek, Oregon, Hartford and Mineral Point. Electric rates for municipal plants have been considered in cases from Merrillan and Clintonville.


RANDOLPH MUNICIPAL
WATER PLANT.
Monthly Charges
2.00
1.50
1.00
.50
Consumer A
Consumer B
Consumer C
Monthly Consumption in Gals.
1000
2000
3000
4000

There are many instances where localities operating municipal plants realize that inequalities exist and apply to the Commission to make adjustments.[1] These voluntary applications typify the aid which a state commission can render a municipal plant in the matter of rate-making alone.

A further indication of real assistance that a state commission can render to a municipal plant is in the settlement of bitter local strifes. For several years the city of Sparta has been quarreling over its water plant. The Commission has made an audit of the plant, installed a system of accounts, adjusted the rates, and the municipal row has entirely subsided.

It is only through the aid of a state commission that such service could be secured by a municipal plant. The state has no interest in these disputes, except to deal justly upon the facts, and in the large majority of the cases all parties at interest are willing to submit the matter for settlement. Hence, as has been indicated, the service which the state renders to a municipal plant divides itself into three classes: (1) assistance in establishing proper uniform accounts; (2) regulation of service; (3) engineering assistance. Of what direct aid has the state been to municipal utilities in dealing with these three problems?

Previous to January 1, 1912, the methods of accounting were left largely to the utilities themselves. The records of many plants were so incomplete that control by the state was imperative. Out of 177 municipal plants, 166 maintained operating accounts so faulty that the Commission could not obtain the true operating expenses. Out of 38 cases where the Commission was called to render special accounting assistance, 26 were municipal plants. In muni-

[1] Applications to make adjustments have been received among other cities from Fond du Lac, Baraboo, Evansville, Richland Center, Marshfield, Edgerton, Clintonville, Watertown, New Holstein, Columbus, Sheboygan, and Jefferson.

cipal plants in the following thirteen cities complete systems were installed: Bloomer, Clintonville, Elkhart, Elkhorn, Grand Rapids, Kaukauna, Kilbourn, Lake Mills, Medford, Montfort, New London, Plymouth and Sharon. This service is furnished by the state to the municipality without expense to the latter, except for the cost of printing the blanks.

Turning now to the question of service furnished by municipal plants, the improvement has been marked. Through the constant visits of inspectors, managers of municipal utilities have been taught the importance of uniform electric voltage, the method of testing the accuracy of meters and other information regarding plant operation. Here is a report of one inspector covering a period of four months:

This inspector made twelve inspections at municipal plants and forty inspections of plants not municipally owned, during this time.

The assistance given in connection with the inspection of municipal plants included information on meter testing for six of the municipal plants; one plant was shown how to test 220 V. meters using their 110 V. rotating standard; one plant was instructed in proper methods for testing three phase meter. Officials of another plant were interviewed regarding the progress it was making with meter testing, and one of the newer plants was assisted in making a number of meter tests. Meter test record forms were drawn up for three plants and one plant was given advice regarding the metering of street lighting current. Two plants were given information on their own request regarding methods of operating the plant; three had the inspector draw up suitable forms for station records; one was given advice regarding the general matter of voltage regulation; one was given assistance in the use of graphic recording instruments; one plant was advised as to how best to overcome difficulties due to unbalancing of the system, and another was assisted in eliminating the trouble caused by moving-picture machine. One plant asked

advice regarding the running of its high tension lines across railroad tracks. The administration of two cities asked general advice regarding improvements they proposed making in their plants. One group of city officials was given information regarding changing from a single-phase to a three-phase system; one plant was advised regarding lamp renewals; a new plant had all rules of service thoroughly explained to its lighting commission at its special request. General advice was given with regard to rates at the request of one administration, and the importance of accounting was pointed out to one administration at its request. One city obtained information regarding interferences between high voltage power lines and transmission lines; the switchboard instruments were found out of adjustment and adjusted in one municipal plant; in another, assistance was given in a complaint meter test, which led to the discovery of a wrong meter constant which has been causing a complaint which the local inspector had been unable to satisfactorily settle. In another city a meter test was witnessed by the inspector at the request of the operator. All of the above assistance was rendered to officials or employees of municipal plants and in a large proportion of the cases information was given to several officials, and in some cases given before a meeting of the lighting commission and the village board.

A more complete summary of inspectors' records will reveal some of the more important accomplishments. Service inspections covered fifty-three municipal plants in 1909 and fifty in 1912. For comparative purposes the meter testing and voltage records of these municipal plants in 1909 and 1912 have been compared with the same records for fifty-two private plants in 1909 and fifty-five in 1912. See page 287 for the results.

The fact that municipal plants do not improve service as readily as private plants is perhaps due to the fact that managers of municipal plants are changed oftener; many of the electric plants are small and the employees render other service to the city; the superintendents are not always

	Municipal		Private	
	1909	1912	1909	1912
Average per cent of meters tested properly by the utility	20	60	15	79
Number of plants testing over 90 per cent of meters properly by the utility	6	19	3	38
Number of plants testing less than 10 per cent of meters properly by the utility	38	11	39	5
Number of plants testing all meters properly	2	15	3	26

skilled managers. In some small cities the superintendent acts as village marshal, meter inspector and general engineer. Here is where the state renders a public service when by inspection, supervision, and the furnishing of advice to the managers of municipal utilities it develops and sustains the plant at a point of reasonable efficiency. In this respect the state Commission stands in relation to the local municipal utilities as a central clearing house of information regarding public utility methods and experience everywhere.

Scores of municipal plants have received engineering assistance from the Commission;[1] valuations have been made and deficiencies in the facilities have been corrected. There are some municipal water plants in which deficiencies have been discovered by the engineering staff which unless corrected would probably have resulted in serious consequences. One example of engineering aid to municipal plants taken from the records of the Commission will illustrate:

[1] Among the cities and municipal plants which have received services from the engineering staff of the Railroad Commission are: Baldwin, Barron, Bloomer, Cashton, Columbus, Darlington, Eau Claire, Elkhart Lake, Elroy, Ft. Atkinson, Hudson, Jefferson, Kenosha, La Crosse, Madison, Marshfield, Milwaukee, Neenah, New Lisbon, New Richmond, Portage, Sheboygan, Sparta, Tomahawk, Watertown and Westby.

The city authorities of Portage requested advice from the Commission's engineers as to the advisability of contracting with the Kilbourn Power Company for electric current and using electric instead of steam power for operating the city waterworks. City also requested an examination and report upon the condition of its plant and equipment with recommendations as to any repairs and improvements needed. Both requests were granted.

Speaking of some of the possible benefits of state regulation of municipal plants, Delos F. Wilcox has said:

In so far as regulation is effective it will result in [1] the training of a large body of technical men to look at public utility problems from the public point of view. This development will make the municipalization of public utilities more practical and the success of municipal operation more likely. From this point of view, regulation is merely training men for the more direct and far-reaching responsibilities of public ownership and operation. . . . It is further to be expected that the public knowledge which comes from uniform accurate and detailed publicity will make municipal ownership more feasible and private ownership less alluring than heretofore.

In private plants the entire resources, skill and ability of the management are directed to the one end of service and plant development. Often these conditions are lacking in municipal enterprises, a circumstance that makes state regulation all the more important to the consumers, taxpayers and the public.

[1] Delos F. Wilcox, "Effect of State Regulation on Municipal Ownership Movement," *The Annals of the American Academy of Political and Social Science*, May, 1914, 83-84.

CHAPTER XXI

STATE VERSUS LOCAL CONTROL

No one will longer contend that regulation of public utilities is unnecessary. There are differences of opinion, however, as to the method of control to be applied in the solution of utility problems. Two schools of regulation have appeared. First, are those who believe in the control of utilities by the local unit. This system is sometimes called "home rule" regulation. Second, are those who advocate regulation by a state utilities commission, as in New York, Wisconsin and many other states. This system is based on the clearly defined legal doctrine that the state is paramount and that "a municipal corporation is, as far as its purely municipal relations are concerned, simply an agency of the state for conducting the affairs of government."[1] The state's right to regulate public utilities has been the subject of much misapprehension.

Advocates of local control present three possible methods of regulation: (1) through the terms of the franchise issued by the locality to the utility; (2) by creating a local utilities commission to regulate service and rates; (3) by enacting municipal ordinances as the necessities arise.

The plan of franchise control has been so universally attempted that there are sufficient results to judge of its merits. At the outset the distinction should be made, however, that "when the franchise is lawfully granted, it is a

[1] *Williams* v. *Eggleson*, 170 U. S., 304; *also Atkins* v. *Kansas*, 191 U. S., 207.

franchise grant from the state and not from the municipality, as the latter acts only as the agent[1] of the state." Acting upon this legal principle the legislature of Wisconsin enacted a law by which the indeterminate permit superseded the franchise. This was fundamental to state regulation. But it is not probable that there was a single franchise in effect at the time of the substitution, which contained adequate rate and service provisions. When a franchise is originally granted, the common council or authoritative body attempts to drive a shrewd business bargain with the managers or owners of the prospective utility. So it has usually put into the contract such details as the number of fire streams or the rated candle power of arc lights, both of which tests have since been superseded through the development of the art.

Ordinarily a franchise is for a period of twenty to fifty years. Within that single interim the history of franchises shows that standards of service and rates have undergone a revolution. Even the Railroad Commission, after five years of use, found it necessary to change its service requirements to keep pace with developments. Under such circumstances, is it not probable that service and rate requirements written into a franchise in 1894 would be antiquated in 1914? But even if these standards were still satisfactory there is usually no city agency to determine that the requirements are being fulfilled.

Franchise provisions fixing definite rates to be charged are even more unsatisfactory. Often in the bargaining between the common council and the utility manager over rates to be permitted by the terms of franchise, concessions are made to the city that must of necessity be offset by extra charges on the private consumers. Again the facts upon which rate provisions of a franchise should be predi-

[1] *Milwaukee* v. *Mil. Elec. Ry. Co.*, 144 N. W. Rep., 206.

cated are difficult to obtain and still more difficult to determine. So rapid has been the development of the art in the gas, electric and telephone fields[1] that what might be a reasonable rate charge for one year would be wholly unreasonable thereafter. For example, both Milwaukee and Superior, the two largest cities of the state, originally granted street-car franchises containing rate of fare limitations which the Railroad Commission has now found excessive.[2] Litigation to determine whether these rates can be lowered by the state amending the franchise is pending in the United States Supreme Court, the Wisconsin Supreme Court having previously sustained the validity of the Commission's reduction.[3] Thus, using ordinary prudence and judgment, the city officials were unable to see far enough in the future to compass the situation.

"In 1885, the average price of illuminating gas in this country was a little over $2.00 per 1,000 cubic feet," says George C. Mathews, chief of the statistical department of the Wisconsin Railroad Commission, in discussing the uncertainties in making franchise rates.[4] "In 1907 the average price was $1.37. The average price of all gas in 1885 was about $1.84, and in 1907 it was $1.10.

"Aside from the development of the industry, however, there is another feature which very often prevents rates fixed by franchise from being satisfactory. From the point of view of a public utility there is almost no comparison between the average city of 6,000, and the average city of

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[1] Commissioner Roemer, Address, Camp Co-operation Book of Proceedings, 1913, 74.

[2] *City of Milwaukee* v. *T. M. E. R. & L. Co.*, 1912, 10 W. R. C. R., 1-305; *Superior Commercial Club et al.* v. *Duluth Street Railway Co.*, 1912, 12 W. R. C. R., No. R. 577.

[3] 153 Wisconsin Reports, 592.

[4] G. C. Mathews, Address, Proceedings of the First Annual Convention of the League of Municipalities of Minnesota (Oct. 17, 1913), 124.

20,000. Yet in the twenty years from 1890 to 1910 the city of Kenosha, Wisconsin, grew in population from 6,530 to 21,371. The condition under which public utility service was furnished in that city underwent an entire change. Now suppose a twenty-year franchise had been granted in 1890 fixing the rates for service, of what possible use would it have been in 1910? In some of the western states the conditions are even more extreme. The city of Spokane grew from less than 20,000 in 1890 to over 100,000 in 1910. So we see that when it comes to the regulation of rates and service by franchise, this regulation is of practically no value, because when the franchise is granted, the city does not generally possess facts which enable it to establish reasonable rates and adequate standards of service because the changes in the industry make the standards of service and the rates of to-day entirely inadequate and unreasonable before the expiration of the franchise, and because the growth of the city itself changes conditions under which service is furnished."

Confronted with the defects of franchise regulation, supporters of local control contend that the same power of regulation should be granted to the local unit as is enjoyed by the state over the railroads. It was in response to this sentiment that the legislature incorporated the following provision in the original Public Utility Law:

SECTION 1797 m-87. Every municipal council shall have power (1) to determine by contract, ordinance or otherwise the quality and character of each kind of product or service to be furnished or rendered by any public utility furnishing any product of service within said municipality and all other terms and conditions not inconsistent with sections 1797 m-1 to 1797 m-109, inclusive, upon which such public utility may be permitted to occupy the streets, highways or other public property within such municipality, and such contract, ordinance or other determination of such municipality shall be in force and prima facie reason-

able. Upon complaint made by such public utility or by any qualified complainant as provided in section 1797 m-43, the commission shall set a hearing as provided in sections 1797 m-45 and 1797 m-46 and if it shall find such contract, ordinance or other determination to be unreasonable, such contract, ordinance or other determination shall be void.

(2) To require of any public utility by ordinance or otherwise such additions and extensions to its physical plant within said municipality as shall be reasonable and necessary in the interest of the public, and to designate the location and nature of all such additions and extensions, the time within which they must be completed and all conditions under which they must be constructed subject to review by the commission as provided in subdivision 1 of this section.

(3) To provide for a penalty for non-compliance with the provisions of any ordinance or resolution adopted pursuant to the provisions hereof.

(4) The power and authority granted in this section shall exist and be vested in said municipalities, anything in sections 1797 m-1 to 1797 m-109, inclusive, to the contrary notwithstanding.

Thus the same broad powers of regulation are first given to the city to use, if it chooses, leaving to the Railroad Commission only the right to review such regulations upon complaint. Whether it is that the municipal authorities feel that these regulatory powers can most effectively be exercised by a state commission, which is not influenced by local prejudices, or that the heavy expense to employ experts to make investigations and valuations is too large, has not been explained. The fact remains that practically no local authority has availed itself of the power of regulating. This condition obtains also in the other states where public utility commissions with powers similar to that in Wisconsin have been created.

To determine the feasibility of local or state control it is necessary to review the problems confronted in the

field of public utility regulation. There are three primary considerations: (a) service; (b) rates, and (c) security issues.

As already explained in the chapter on service the state has fixed standards for all classes of utilities and enforces them through a system of inspection. Reference to the accomplishments has also been made.[1] That local regulation, mostly through franchise provision, prior to the passage of the utility law, was ineffective, has also been illustrated by statistics. Every rate case involves the question of service.[2] The existence of these inequalities is well illustrated in the case of the *City of Kaukauna* v. *Kaukauna Gas, Electric Light & Power Company*, in which the Commission said:

> The evidence shows conclusively that respondent's plant [3] and distribution system are wholly inadequate to meet the reasonable requirements of the city. The distribution system was poorly constructed in the first instance and has never been properly maintained since. It requires reconstruction. The power plant is in little better condition than the distribution system. According to the proposed plans of the company for altering and improving the power plant, it would seem that much of the plant is obsolete. It lacks many appliances necessary to the rendering of good service. The service rendered to the public in the past has not only been unreasonably inadequate, but much of the time intolerable. The rules prescribed by the Commission concerning the standard of service required of every such utility have not been observed, and could not be observed until extensive work of repair, reconstruction and extension of the power plant and distribution system was first performed. Further delay in put-

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[1] *See* Ch. V; *also* Ch. XX, showing service improvements in municipal plants under state regulation.

[2] *In re Application Manitowoc Gas Company for Authority to Equalize Rates*, 1908, 3 W. R. C. R., 163, 180.

[3] *City of Kaukauna* v. *Kaukauna Gas, Electric Light & Power Co.*, 1910, 5 W. R. C. R., 703.

ting the power plant and distribution system in efficient operating condition will not be endured. The public is entitled to reasonably adequate service.

No extensive discussion will be undertaken in this connection of the subject of rates. The facts upon which rates are based and the method of computing them have already been outlined. A few of the cases before the Commission will be referred to, however, to clarify the elementary principles, that the reader may be able to judge as to whether the locality would be able at a minimum of expense to secure the facts necessary to just and reasonable rate regulation. Rates to be just must eliminate discriminations as nearly as possible; must aid in securing the maximum development of the business; must secure the lowest rates possible for the service furnished and at the same time provide a fair return on the actual investment.[1] How extensive public utility rate discriminations were before the law was passed will never be mathematically known. It has been estimated that the favors granted by local utility corporations amounted to over $2,000,000 a year.[2] One year after the law was passed, Commissioner B. H. Meyer said: "The whole state was literally streaked and plastered with discriminations in the rates of utilities; and in all the rest of the country, where the extent of such discriminations has not yet been determined as it has in Wisconsin, it is quite probable that discriminations similar in character and extent likewise exist. . . . For thirty-two of the reporting (telephone) companies, eight out of every one hundred subscribers received free or reduced service." Seven big consumers were served water in one city of 4,000

[1] Many of the facts upon which this portion of the chapter is based are taken from a report on State versus Local Control of Public Utilities (unpublished at this time) made by W. C. Reyer, a member of the Commission's staff, to the Commission.

[2] F. C. Howe, "Wisconsin an Experiment in Democracy," 73.

inhabitants without charge. In Madison, the capital of the state, 1,360 telephone users out of 5,000 received reductions amounting to $1,120 a month. Discriminations also existed between public and private users; between metered and unmetered users and between power and light consumers. In Ashland the city was paying about $8,400 less for water than its share.[1] The electric light investigation in Beloit showed "an average revenue per kilowatt hour from residence consumers of 13.6 cents, from saloons of 5.9 cents, stores 6.7 cents, and hotels 6.4 cents. The facts show quite clearly that the residence consumers in Beloit have been compelled under existing rate schedules to bear more than their proper share of the cost of the service rendered."[2]

Enough has perhaps been said to illustrate the extent and viciousness of discriminations in rate schedules. Regulation whether by the locality or the state must be of the character that will detect these inequalities and eliminate them, with such adjustments that each consumer shall be required to meet his proper share of the expenses of the utility.[3]

Directly bearing upon the rate question is the development of the business. Rates may be so high as to make the use of the service prohibitive; or one class of rates may be out of proportion with the rates for other classes, causing a lack of development within that class. Equitable rates encourage the widest use of the service with proper regard for each class of users.

After the decision was announced on July 19, 1911, in

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[1] *City of Ashland* v. *Ashland Water Co.*, 1909, 4 W. R. C. R., 297.

[2] *City of Beloit* v. *Beloit Water, Gas and Electric Co.*, 1911, 7 W. R. C. R., 376.

[3] For a clear presentation of arguments and statistics in favor of limited state control and wider local control *see* Dr. Delos F. Wilcox, Article in *National Municipal Review*, III, No. 1, 1911.

the Beloit case cited above, readjusting the rates, a change occurred that demonstrates the importance of the Commission giving cognizance to the principle of saturation of territory.

Year ending June 30	Residence Consumers		Kilowatt Hours Consumed		Average rate per kilowatt hour	Total Revenue	
	Number	Per cent increase over previous years	Amount	Per cent increase over previous year		Amount	Per cent increase over previous year
1909	388	.....	135,154	.....	$0.1238	$16,746.11	.....
1910	449	13.6	178,840	32.3	0.108	19,383.46	15.7
1911	501	11.5	192,697	7.7	0.108	20,893.35	7.5
1912	595	18.7	233,785	21.3	0.094	22,000.43	5.3
1913	851	43.0	300,513	28.1	0.0895	26,898.71	22.3

Notice the rapid development of business under the adjustment of rates of residence users. During the year 1913 the number of residence consumers increased 43 per cent, the consumption 28.1 per cent and the revenues 22.3 per cent. For the year previous there was also a decided increase.

The necessity of allowing the utility a reasonable return upon its investment, to attract sufficient capital for a full development of the business, has already been fully explained in an earlier chapter. It is an element to which every regulating body must give recognition. Capital will not enter except under terms as reasonable as are to be found for the same risk in other enterprises.

The story of the looting of such railroads as the New Haven, the 'Frisco and other lines; the watering of the stocks of public service corporations and other schemes of frenzied finance, have been too common not to attract the attention of state and national legislatures. Few will contend that the locality should regulate security issues. Granted the power it might be neglected as was public

utility regulation before the era of state control. It is the nullification of this regulation that is most desired by financial speculators. In recent years many states have passed laws delegating some state agency or commission to supervise the issues of stocks and bonds. Its importance is well settled in the public mind.

The question then is: Can the locality regulate public utility service, rates and securities as adequately as a state commission?

Among the more important reasons why local regulation cannot effectively [1] meet these problems are:

I. Necessary information will not be available.

II. Local regulation is too expensive for the locality to maintain a competent staff necessary to secure this information.

III. The municipality is too limited a unit of control.

IV. Politics and local bias affect local regulation.

V. There has been an inability of localities to adjust rates in the past.

The necessity of scientific and uniform accounting in public utility regulation is at once apparent. There must be accurate cost records based upon proper charges. Before the day of state regulation in Wisconsin an examination of the accounting methods used by many of the utilities disclosed a lack of understanding of the items in the making of the charges; no recognition of the distinction between repairs and replacements, between construction costs and operation expense, and often a mixup of other similar transactions that unless corrected would obscure the true profits of the business. Even the municipal plants have

[1] The five reasons why local regulation is ineffective were worked out in the brief to the Commission by W. C. Reyer of the Commission's staff. Much of the information presented here has been obtained from that report and the examination of cases cited.

not maintained accurate records in the past. The Commission found only 10 per cent of the municipalities, operating water and electric plants, valued in the aggregate at $16,000,000, with records sufficiently definite to determine the results of operation.[1] The conclusion would seem inevitable that when municipal utility records need such general supervision from outside, it would not be inherent in the city to accurately supervise the records of private utilities operated within its borders.

Moreover, scientific records kept on a uniform basis for all cities are necessary for comparative purposes in rate-making. The previous chapters on accounting and operating expenses illustrate the invaluable use to which these data are applied in determining normal costs for every step in the process of operation.[2] Abnormalities are eliminated and utility companies are forced into comparison on a strict business basis.

Not only do the cities lack the authority to enforce uniform accounting systems upon other cities, but the cost of obtaining, correcting and compiling the necessary information would make it almost prohibitive. The collection of such statistics requires the services of a competent staff for small as well as the larger cities. There are 268 cities in the state to which some form of utility service—water, gas, electric or a combination of these—is furnished. Two hundred and fifty of these cities have populations of less than 10,000 inhabitants, and only one has over 50,000 people according to the last census. Is it reasonable to expect that the two hundred and fifty smaller cities could bear this heavy expense? Competent auditors in private practice charge from $20 to $50 a day. Consult-

[1] Mathews, Minnesota address before League of Municipalities, *op. cit.*; *also see* discussion and table of municipal plants, Ch. XX.

[2] *See* Table I, Ch. VI; *also City of Racine* v. *Racine Gas Light Co.*, 1911, 6 W. R. C. R., 270.

ing engineers charge from two to four mills on the dollar for making valuations. Because the Wisconsin Commission maintains a regular staff the valuations made by it cost from one to two mills on a dollar. Valuations of gas and water plants in small cities under 5,000 inhabitants cost the Commission from $80 to $160. Should these valuations be made privately the cost would be several times greater. The recent expert investigation of gas rates in St. Paul, Minnesota, cost the municipality $55,000, and the matter is now in the courts where added expense will be incurred. The valuation of the Milwaukee Gas plant, a property of about the same size, cost the Wisconsin Commission $8,500 and the Milwaukee street-car company has properties twice as valuable as the gas company in St. Paul, and that valuation only cost the Commission $11,000. The state can make the valuation cheaper and there is seldom the court contest aftermath. Because of the expense, undoubtedly the result of local regulation in Wisconsin would be that the 439,789 people living in the two hundred and fifty cities under 10,000 inhabitants would go without any utility regulation whatever. This would be a return to conditions that existed before the Public Utility Law was passed, when discriminations and inequalities were rampant.

But a still more serious defect is to be found in the fact that the locality is not the natural unit of control. The argument strikes with particular force municipal plants that extend beyond municipal limits. A telephone utility, with extensive toll connections, breaks over the borders of geographical subdivisions; an interurban system extends through several towns, and electricity for lighting and power purposes may be transmitted across a state, serving many villages and cities. This view is expressed by Delos F. Wilcox, a recognized authority on public utility regulation.

After all the day of walled cities is past and now an urban community[1] is primarily a congested spot on the state map, a center of population and industrial activity intimately related to the personal and property interests of all the citizens within its sphere of influence, which often extends to and beyond the boundaries of the commonwealth itself. Public utilities, although still comparatively simple industries, have grown far enough beyond merely local bounds to require complex governmental machinery to operate or regulate them.

The original power of regulation is inherent in the state. "A municipal corporation is a public instrumentality established in aid of the administration of the affairs of the state."[2] A state commission can exercise no greater power than the legislature endows it with. A *local commission*, if given the power, cannot overstep its boundaries in the enforcement of its mandates. A review of actual conditions makes the analogy plain. Only 6.38 per cent, out of a total of 642 telephone exchanges in Wisconsin, operate in urban communities; 93.62 extend beyond municipal limits. Under local regulation over nine-tenths of the telephone systems would be able to escape complete regulation by one body, or be subjected to as many different systems of regulation as there were communities through which they passed. The authority and achievements of the Commission in enforcing physical connection between separate exchanges for toll and local service in a score of communities, as already explained, would have been a practical impossibility under local regulation.

Similar conditions appertain among Wisconsin gas and electric companies[3] and every year brings further con-

[1] Wilcox, "Municipal Franchises," II, 704.

[2] *Covington v. Kentucky*, 173 U. S., 241.

[3] Wisconsin gas plants that serve more than one community are: Racine Gas Co.—supplies Racine and sells to Kenosha; Wisconsin Traction, Light, Heat & Power Co.—supplies Appleton, Menasha and

solidations of companies that make the problem of local regulation the more complex. As a culmination of this movement of consolidation there are some who predict that a movement will arise for the state ownership of the intermunicipal utilities such as interurban railways and traction lines.[1] Such consolidations are a condition not only typical of Wisconsin but of other states, as an examination of the attached maps for Wisconsin, Illinois, Iowa and Michigan illustrate. The Commonwealth Power Company of Michigan supplies twenty-one cities and villages; the Grand Rapids-Muskegon Power Company of Michigan supplies fourteen;[2] the Iowa Railway and Light Company furnished gas, electric or electric railway service to forty-eight cities and villages; the Central Illinois Public Service Company has properties in one hundred cities and villages. To carry out the principle of local control there would be forty-eight bodies regulating one company in Iowa and one hundred

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Neenah; Milwaukee Gas Light Co.—supplies Milwaukee and sells to Milwaukee (Welsbach Street Lighting Co. of America), Wauwatosa (Wauwatosa Gas. Co.), and West Allis (West Allis Gas Co.).

Some electric utilities that extend beyond municipal borders in Wisconsin are: Interstate Light and Power Co.—operates plants in Platteville and Shullsburg and sells current to municipal plants at Benton, Cuba City and Hazel Green; Wausau Street Railway Co.—operates in Wausau, Seofield and Rothschild; Wisconsin Traction, Light, Heat & Power Co.—operates in Appleton, Menasha and Neenah; Chippewa Valley Railway Light and Power Co.—operates in Chippewa Falls, Eau Claire, Elk Mound, Menomonie and Altoona and sells power to plants in Bloomer, Cadott and Elmwood; and the Milwaukee Light, Heat and Traction Co.—operates in Cudahy, E. Milwaukee, E. Troy, Hales Corners, Mukwanago, Pewaukee, Racine, Rochester, So. Milwaukee, St. Francis, Waterford, Wauwatosa, West Allis, West Milwaukee and White Fish Bay.

[1] Delos F. Wilcox, "Effect of State Regulation on the Municipal Ownership Movement," *Annals of American Academy of Political and Social Science*, May, 1914, 84.

[2] The map of Michigan was compiled from information secured from the Hodenpyl, Hardy & Co., Detroit; for Illinois from a map appearing in the *Electrical World*, May 31, 1913, I, 146; and for Iowa and Wisconsin from *Moody's Manual*, 14th ed.

Watertown
Oconomowoc
Delafield
Waukesha Beach
Waukesha
Map showing
System Controlled
by
Subsidiary Companies
of
The Wisconsin Edison Company
Inc
Milwaukee
Cudahy
South Milwaukee
St Martins
Mukwonago
East Troy
Waterford
Rochester
Burlington
Racine
Kenosha
LAKE MICHIGAN
Key
Electric Railway Lines
Steam Plants
Water Power Plants
Gas Plants
Electric Sub-Station
Electric Service
Steam Plt & Sub-Station
Water Power
Elec Service
Electric & Gas Service
Heating
Gas &
D
251

commissions regulating parts of the one corporation in Illinois.

Milwaukee's conditions present a like complexity as an investigation by Mr. Mathews shows:

"Perhaps a brief outline of some of the steps to be taken [1] in regulating electric railway rates in Milwaukee will show the defects in local control. There are fourteen power plants and substations, some of which supply current for both railway and lighting, and supply steam for heating. There are thousands of feet of transmission lines overhead and underground, which are used jointly for lighting and railway. There are 600 cars, 360 miles of track, and over 360 miles of trolley wire, of which large portions are used interchangeably by the railway systems which give interurban service in Milwaukee over 18 lines, in Racine over 4 lines, in Watertown over 1 line, and operate 9 suburban and 3 interurban lines. The Commerce Street power station supplies current for city lighting, city railway, and the interurban railways within a radius of 20 miles. Shops and equipment in Milwaukee are used for the entire system. Moreover the Milwaukee system buys hydroelectric power from the Kilbourn dam, over 100 miles distant, which would be entirely beyond city control. It is easy enough to say that the city should have control within its own limits, but the Milwaukee system serves not only the city, but a large portion of the State."

The inability of a system of local control confined to narrow limits to cope with the utility problem would appear incontrovertible.

There are other disadvantages. Under local control public utilities may become political footballs.[2] Chicago

[1] Mathews, Address at St. Paul, *op. cit.*

[2] Wilcox, "The Control of Public Service Corporations in Detroit," *Annals of the American Academy of Political and Social Science*, XL, 576-592; Gray, "The Gas Supply in Boston," *Quarterly Journal of Economics*, XII, 419-446; XIII, 292-313; XIV, 87-120; Hotchkiss, "Chicago Traction, a Study in Political Evolution," *Annals of the American Academy of Political and Social Science*, XXVIII, 385-404; XXXI, 619-629.

Map of the
State of Illinois
Showing the properties controlled by
The Central Illinois Public Service Co.
Key.
Electric Service Available
Combination Heating Plant
(Winter Operation)
Ice
Central Power Plant
(All Year Operation)
Transmission Lines Complete or in
course of construction
Transmission Lines Proposed
Interurban - Complete
- - Proposed

recently waged a stirring municipal campaign over gas rates. The party out of power will promise most any reform of a public utility, regardless of its reasonableness, to turn an election. State control helps to take the utility out of politics and gives outside, disinterested parties an opportunity to study the plant and local conditions, free from party strife and political bias, and order adjustments of service and rates reasonable to both the utility and the public.

The inability of local managements to adjust rates in the past is shown by the discriminatory schedules in effect at the time the Wisconsin Public Utility Law was passed. This is another factor that militates against local control. A single case out of many that have come before the Commission will illustrate:

> The applicant in this case stated in its petition that [1] it desired to make such changes in its rate schedules as to enable it to more fully extend its business. At the hearing in the matter it was shown that the present schedules were not, on the whole, so adjusted as to meet local requirements. These facts were also substantiated by the further investigation into the situation which was made by this Commission. For these reasons the applicant was authorized to adjust its rate schedules on the basis outlined in the order in this case.

As described in the previous chapter many of the schedules including rates for municipal plants submitted by utilities to the Commission for approval prove on investigation to be regressive and discriminatory. Rates to be just must be scientifically made, after an investigation and an analysis of the facts, which the locality is seldom able to obtain, because of their inavailability or expense of

[1] *In re Application of Stoughton Municipal Electric Light System for Authority to Increase Rates*, 1909, 3 W. R. C. R., 484.

Boone
Ames
Nevada
Slater
Ankeny
Oxford Jct.
Tipton
Electric (Power & Light)
Gas & Electric
Electric & Street Railway
Heat, Electric & R.R.
Gas,
Power House
Interurban Railway
Proposed Railway
High Voltage Line
Proposed High Voltage Line
Electric (Furnished) Distributed

obtaining. That this is coming to be a recognized fact by cities is indicated by at least a dozen voluntary requests by municipal and private bodies to the Commission to make adjustments for them. Efforts to change the present state control system have been repeatedly defeated.

Those who are best qualified to judge are not especially enthusiastic over the method of local regulation attempted through the passage of ordinances by a common council. This is a third plan of local control. Such a system has been tried in Iowa. In the case of the *Des Moines Water Company* v. *City of Des Moines*[1] involving the validity of an ordinance fixing water rates, Judge McPherson of the federal court spoke thus of the delays and expenses incident to such proceedings in court:

> It is now more than three years since the passage of this ordinance. This case illustrates the evils in connection with the fixing of rates by municipalities to govern public utility corporations, . . . by the time this case is decided by an appellant court, at least four years will have elapsed from the passage of the ordinance until the matter is put at rest by the courts. . . .
>
> It is well known by all informed men that city councils necessarily adopt rates with but little or no investigation as to what rates ought to be fixed. The result is we have ordinances fixing rates based upon but little intelligent effort for the ascertainment of the facts. Some of the states like New York, Massachusetts and Wisconsin, have state commissions of competent men, who give public hearings, and who do nothing behind doors, nor in secrecy . . . a commission with no member interested as a taxpayer of the city, and with no member subject to influences other than the ascertainment of the truth and the facts. Rates are thus fixed with which most fair-minded people are ready to acquiesce. It is strange that we have no such legislation and no such commissions in Iowa.

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[1] *Des Moines Water Co.* v. *City of Des Moines*, decided Sept. 16, 1911, 192 Fed., 193.

Map Showing
Generation, Transmission and
Distribution System
of the
Consumers Power Company
Electricity Supplied
Water Power Gen. Plants
Steam
Substations
Steam Power Plants Leased
Trans. Lines Completed and
in Operation
Trans. Lines Leased and
in Operation
Trans. Lines under Con-
struction
Trans. Lines Planned
LAKE
HURON
MICHIGAN
LAKE MICHIGAN
Bay City
Saginaw
Flint
Pontiac
Owosso
Jackson
Alma
Lansing
Battle Creek
Kalamazoo
Grand Rapids
Muskegon
Total

Again in the later case of *Des Moines Gas Company* v. *City of Des Moines*,[1] which involved the validity of a city ordinance fixing rates for gas, the same court said:

> Much of this kind of litigation, and practically all of the expense, would be avoided if Iowa, like so many of the other, including neighboring states, had an impartial and city non-resident commission or tribunal, with power to fix these rates at a public hearing, all interested parties present, with the tribunal selecting its own engineers, auditors and accountants. Too often we have selfish, partisan prejudice, and unreliable experts engaged for weeks at a time, at $100 or more and expenses per day, exaggerating their importance, and making the successful party in fact a loser. With all our boasted advancement, Iowa is a laggard in this matter, and will continue as such until these rate-makings are taken from the power of city councils. Appeals to the courts will seldom be taken from the findings of such a tribunal.

Aside from the benefits of state regulation over local control, suggested by the court quoted above, there are other advantages but these have been covered in such detail already in the volume that further reiteration here is unnecessary. It was to escape the evils of local control that the Wisconsin Public Utility Law was enacted.[2] State regulation is not undemocratic; it does not interfere with the powers of the community but aids and supervises them. As the decision in the Madison Gas case shows, the state

[1] *Des Moines Gas Company* v. *City of Des Moines*, decided Aug. 12, 1912, 199 Fed., 204.

[2] At the request of citizens of Madison the common council sought to compel the gas company to lower its rates. The gas company asked the circuit court for an order preventing the city from examining the books of the company, which was refused by the circuit court, but the supreme court remanded the cause with directions to dismiss the complaint in 1906. Occurring in the capital city of the state, this case which showed the helplessness of a city to obtain just treatment for its citizens, aroused the feeling that culminated in the enactment of the Public Utility Law in 1907. *See City of Madison* v. *Madison Gas & Electric Co.*, 108 N. W. Rep., 65.

Public Utility Law gave the communities a power of regulation, heretofore reposed in the state legislature, and which the municipalities never before possessed.

With local regulation an aggrieved utility user must make a complaint to the common council of his city, which may be induced, unless bribery interferes, to pass an ordinance directed to relieve the condition. If the ordinance is violated the aggrieved taxpayer may start proceedings in the courts. Most ordinary mortals, however, have neither the patience nor funds with which to litigate with a large corporation, so they bear their little wrongs unremedied. Under state regulation a postal card complaint will start the wheels of investigation and the order of the state commission has all the legal resources of the state at its command to sustain its validity. Thus is the poor man given the aid of the state in remedying conditions, which otherwise he must either shoulder or bear in silence. Surely such a system of helping the citizen is not to be challenged as undemocratic.

State regulation encourages municipal ownership; enforces proper, uniform accounts and reports; requires reasonable standards of service and enforces them through constant supervision; eliminates abnormal operating expenses; supervises the entire operations of the utility unhampered by local boundaries, and fixes rates upon facts that recognize justice and equality. As the Supreme Court of Wisconsin said of the Public Utility Law: "So far it has been found to accomplish the task with such distinguished completeness that the enactment stands as a most consummate effort of legislative wisdom and a model for similar efforts elsewhere."[1]

[1] *Calumet Service Co.* v. *Chilton*, 148 Wisconsin Reports, 334.

CHAPTER XXII

DOES REGULATION RETARD INVESTMENTS?

Wisconsin has exploded the fallacy of the statement that state regulation stifles business enterprises. There has been no stagnation of business under Commission control. The period of state regulation has been one of wholesome prosperity, except possibly for electric railways. The record of financial operations of corporations regulated warrants no other conclusion. This prosperity has been promoted by the Commission requiring business methods of accounting; by wiping out rebates and discriminatory rates; by abolishing privilege and political corruption; by enforcing uniform service standards; by basing rates on the cost of service rendered and by rearing all upon the foundation of physical valuation of plant. Within the period the 1,189 corporations and plants were subjected to about 8,000 formal and informal Commission orders directing improvements in service and rate adjustments described in previous chapters. These may have checked the speculator, the monopolist or the promoter, who thrive on the industry of others. They have encouraged bona fide investors who now know the real value of the properties back of the securities.

In spite of orders decreasing freight rates and almost daily exactions for improvements in service, railroad lines have been extended. Bonds have been floated and stock market credits have been maintained. Although the greater part of the state was checkered with lines of steam rail-

roads before the regulation law was enacted, further investments have been made. Since 1905 their miles of track in Wisconsin have been extended from 9,755 to 11,679. This is an increase of 12 per cent in seven years.[1] If gross earnings be considered a better barometer, even here the percentage of growth in Wisconsin is remarkable. From $47,917,000 in 1905 gross earnings advanced to $68,262,000 in 1912, or about 43 per cent. Contrast this with the 16 per cent increase in gross earnings in Wisconsin for the five years from 1900 to 1905 preceding regulation and the picture is more convincing.

Similar ratios do not pertain as to all phases of the electric railway industry. A glance at the railroad map of Wisconsin in comparison with states where the electric railway development has been more rapid suggests the reasons. State regulation is scarcely a factor, if at all. For example, Wisconsin has about 500 miles of interurban lines as compared with 1,700 in Indiana. The density of population in the Hoosier State is 79 per cent greater per square mile than in Wisconsin. Indiana, with an area of 36,354 square miles, has a population of 2,700,876, or 74.3 to the square mile. Wisconsin's population of 2,333,860 over a 56,066 square mile area shows a density of only 41.6 to the square mile. Moreover, Indiana's population is more largely urban. Each state has one large city, the natural center of interurban lines. Excluding Milwaukee and Indianapolis in the comparative tables of the two states,

[1] "In 1908 the United States possessed about two-fifths of the mileage of the world, and 15 per cent more than all of Europe; she had 233,677, as compared with 197,381 for Europe, and 595,841 for the world. The American railway industry has, therefore, become tremendously large . . . the greatest of all industries. Its total capitalization is practically $18,000,000,000, probably as much as one-eighth of all the wealth of all the people of the United States. It has in its employ over 1,500,000, largely men, to whom it pays in a single year wages amounting to above a billion dollars."—Raper, "Railway Transportation," 186.

16.5 per cent of Wisconsin's population is in cities of over 8,000 inhabitants, while 39.6 per cent of Indiana's is in cities of the same class. Small villages, the natural feeders of interurban lines, are more frequent along the routes of Indiana's systems. In Wisconsin the larger cities are separated by long distances, making it necessary to cover considerable territory before reaching cities large enough for important terminals. Of the twenty-three cities in Wisconsin with a population of 8,000 or over, fourteen are now served with important interurban systems. The remaining nine are in general too isolated, except for short line developments. Until population becomes more dense, interurban development in Wisconsin must be slow because of these insurmountable physical difficulties. Nevertheless in Wisconsin electric railways show relative progress that is encouraging.

Between 1907 and 1913 the total miles of single tracks of street and interurban lines increased 12.51 per cent; the number of car miles run, 23.8 per cent; the revenue from passengers carried, 37.19 per cent, and the plant investment 68.1 per cent. While there has been an increase in gross revenues, the large increases in operating expenses, noticeable on all systems in the United States within the same period, has had its effect upon the gross revenues. That population is the controlling factor in rapid electric railway development is shown from the reports of net earnings made in Wisconsin cities and in localities where population is dense.

Public utilities operating necessarily within limited areas have made great developments within the period. Their reports furnish incontrovertible proofs that regulation, instead of driving capital out, attracts it. The electric light, gas, telephone and water companies have exceeded the steam railroads in the ratio in which they have made cash investments for new construction.

Since 1907, the year that the Wisconsin Public Utility Law became effective, the gross earnings of electric plants increased from $3,147,000 in 1907 to $6,124,000 in 1912, or 94.6 per cent. Nor is that all. Plant values for the same period reported by these companies jumped from $19,537,000 to $41,747,000 or 113 per cent.

Telephone companies had gross earnings of $3,074,000 in 1907, which reached the total of $5,011,000 in 1912, an increase of 63 per cent. Meantime the plant investments of these same concerns showed an increase from $12,996,000 to $18,309,000 or 40.9 per cent.

Confined to limited areas of development and suffering from the competition of electric enterprises, even gas plants have been able to show a substantial increase in the past five years. During the period their gross earnings increased from $3,539,000 to $4,363,000 or 23 per cent.

Plants supplying water have grown in gross earnings from $1,906,000 to $2,689,000 or 41 per cent during the five-year period, while the increase in plant values has been from $21,090,000 to $24,390,000 or 15.6 per cent.

As already indicated, the result has been that legitimate business investments have been developed and directed along lines of efficiency and business honesty. It is this policy of justice that is encouraging development. With physical valuations and definite data of plant operations, bonding houses are now offering the securities of public utilities that before passed notice. C. E. Salmon of Beloit, a public utility manager, recently declared that state regulation has reduced interest rates at which money for improvements could be secured, 1 per cent.

"We have seen the public utility bond, with great opposition, fight for a market, for a price and for ready absorption," said the manager of the bond department of Marshall and Ilsley bank, Milwaukee, in a recent address. "We have come to realize that to-day it is perhaps the most

attractive form of bond investment, having behind it the ample security of a property rendering an essential service in a growing community, and yielding to the investor the most attractive interest return consistent with conservative security upon the market. The period of greatest development in the flotation of public securities has been the past six or seven years; the greatest incentive thereto has been the enactment of sound public utility regulation laws. Bonds based upon earning power, though reasonably safe, can never equal in security those whose desirability is based primarily upon the basis of physical valuation, plus earning power. A great body of principles, sound in fundamental conception, is embodied within the Wisconsin Public Utility act. It has meant much to the state. It will mean more as time goes by."

CHAPTER XXIII

COMMISSION AND THE COURTS

The original Interstate Commerce Law was greatly modified in intent and many of its underlying principles either weakened or destroyed through decisions of the federal courts.[1] In Wisconsin there has been no judicial interpretation or construction of the provisions of the regulating act, which in any way had the effect of diminishing the primary purposes of the law. The difference in the spirit with which the state and federal courts view economic conditions probably explains the divergent results. Gradually the Wisconsin Supreme Court has abandoned the customary practice of shackling twentieth century progress with eighteenth century ideals. Its temperament has been thus expressed in an opinion[2] by Chief Justice J. B. Winslow: "When an eighteenth century constitution forms the charter of liberty for a twentieth century government, must the general provisions be construed and interpreted by an eighteenth century mind, surrounded by eighteenth century conditions and ideals? Clearly not. This were to command the race to halt in its progress, to stretch the state upon a veritable bed of Procrustes."

The tendencies of the decisions of the Wisconsin Supreme Court relating to regulatory measures have given

[1] Roe, "Our Judicial Oligarchy," 38-41; Meyer, "Railway Legislation in the United States," 224-242.

[2] *Borgnis* v. *Falk*, 147 Wisconsin Reports, 349.

vitality to the principles involved. This is apparent from the general result of the litigation that has arisen out of the various acts administered by the Commission. Out of 2,511 formal orders of the Commission, fifty appeals to the courts have been taken, but in only about thirty were the appeals perfected. The others were abandoned. In two cases the Commission was reversed on a technicality and in two others the issues were framed in amicable suits brought for the purpose of securing a judicial interpretation of certain doubtful phraseology contained in sections of the statute. In both of these amicable suits the orders of the Commission were overruled. Six cases are now pending in the state and federal courts, all other contested orders having been sustained. Through collateral suits brought by railroads, some of which are still pending, in which the Commission or its orders were not directly affected, an even broader interpretation of the scope of the law has been secured than through direct appeals.

The cases considered by the courts naturally fall into two groups and will be considered accordingly: (1) railroads, (2) other utilities. Each of these groups will be subdivided. In connection with the original act creating the Commission and conferring upon it power to supervise common carriers as defined in the act, a number of collateral laws, some in existence at the time of the creation of the Commission, and some subsequently enacted, were considered by the courts. Had any of these collateral acts been seriously weakened by the courts, the scope of the entire scheme of regulation might have been greatly curtailed and its efficiency impaired. But the foresight and judgment of the court in interpreting these various laws regulating large public interests is well illustrated by the determination of the questions which came before it, such as, (a) what powers may be delegated to a Commission; (b) the scope of evidence that may be considered by such

a quasi-judicial body; (c) the adequacy of transportation service to the public; (d) the enforcement of just rates; (e) the safety of railroad crossings, and (f) the control of capitalization.

COURT CASES AFFECTING RAILROAD REGULATION

Within a year after the Railroad Commission Law became effective, the constitutionality of the act was attacked in the courts. The question arose over an order of the Commission made September 15, 1906, directing the Minneapolis, St. Paul & Sault Ste. Marie Railway Company to erect a platform at Dwight, for loading and unloading freight and express and for receiving and discharging passengers, and requiring two trains to stop daily. The new station would furnish service to about sixty-four families. The law was challenged as an unlawful delegation of legislative powers and many sections of the act were subjected to review. Before the supreme court had finally determined the litigation, it invited all the railroads of the state to file briefs and participate in the arguments before the court. The leading railroads of the state accepted the invitation. The decision of the court, as pronounced through Justice Timlin, had a salutary effect in checking appeals to the court. This was due to the broad interpretation placed upon the act, giving the findings of the Commission as much weight as the findings of a jury and greater weight than those of a court in a chancery suit.

After reviewing the history of the legislation in the state for the creation of the Commission and pointing out the impossibility of railroad rate and service regulation by direct action of the legislature, the court held that "the legislature may create[1] a quasi-judicial tribunal and dele-

[1] *M. St. P. & S. S. M. R. Co.* v. *Railroad Commission of Wisconsin*, 136 Wis. Reports, 146; 116 N. W. Rep., 905.

gate to that tribunal the power which the legislature possesses to ascertain, determine and declare facts;" that a general rule of law may be enacted to take effect upon the establishment of certain facts and conditions, and that "statutes declaring that railroad rates and service shall be reasonable, and creating a commission with power to investigate existing rates and service, and to fix and determine what rates and what service are reasonable, the statute then providing that the rates and service so fixed shall be in force, have been generally upheld as a valid exercise of legislative power."

Upon the question that under the law the Commission in establishing a rate merely established the maximum charge that could be exacted, which was urged and received the approbation of one of the dissenting judges, the majority opinion says:

> The law intends that there is only one rate, charge or service that is reasonable and just. The order of the Commission is prima facie evidence that the rates, charge, or service found and fixed by it is the particular rate, charge, or service declared by the legislature in general terms to be lawful and to be in force. If it were conceded that the Commission had power or discretion to fix one of several rates, either of which would be just and reasonable, it would be hard to say that this was not a delegation of pure legislative power to the Commission.

Equally important was the declaration in the opinion that the power of the court to review the orders of the Commission, and to send them back to the Commission for further investigation if found unreasonable, is not an unlawful delegation of legislative powers to the court. The provision of the law stating that before any order of the Commission can be set aside the plaintiff must show by "clear and satisfactory" evidence that the order is unlawful and unreasonable is intended to describe a greater

degree of proof than preponderance of evidence and that "great weight will be given an order of the Commission and a very strong case must be made to establish its unreasonableness."

Like the United States Supreme Court, we accord to the orders of the Railroad Commission the weight due to the decisions of a tribunal authorized by law and informed by experience.[1] But we go further than this, and add the requirement of that particular degree of proof specified in the statute, and we consider the subject matter and scope of the judicial investigation above referred to. We thus leave upon the Railroad Commission the great responsibility which we believe the legislature intended to impose.

In establishing the policy of the Commission the court further said:

In determining whether or not the order of the Commission is unreasonable, it must also be considered that every unnecessary burden imposed upon the railroad impairs the net receipts and diminishes that margin, if there be one, between the amount sufficient to assure a fair return on the value of its property, plus the amount of its fixed charges and operating expenses, and its gross receipts. In this margin the public and the railroad are interested, because it is only when this exists that betterments in construction or improvements in service not imperative or indispensable, or reduction in rates, will ordinarily be voluntarily made by the railroad or can ordinarily be ordered or enforced by the Commission. We are not now speaking of those extreme cases where the public duty must be discharged whatever the financial consequences to the railroad. But in ordinary cases to waste this margin is to waste the fund in which the whole public is interested. This should never be done for the benefit of the few as against the interests of many. It is also to be considered that this margin ought not ordinarily to be exhausted or swept away

[1] *Ill. Cent. R. R. Co.* v. *Interstate Commerce Commission*, 206 U. S. 441, 27 Sup. Ct. 700.

by orders or requirements of the Railroad Commission as fast as accumulated, because human nature or railroad nature is such that no one will long economize on operating or other expenses if his economy only furnishes a larger basis for further exactions.

Thus it was settled by the court that unless an order of the Commission be unlawful or unreasonable it cannot be disturbed. While the court declared that had it been sitting as the Commission it would not have made the order, yet the same being one over which men might reasonably differ, it must be sustained.

The court admonished the public and the carriers to be patient with the necessarily slow and laborious process in working out a system of precedents.

The notion that commissions of this kind should be closely restricted by the courts and that justice in our day can be had only in courts is not conducive to the best results. Justice dwells with us as with the fathers. It is not exclusively the attribute of any office or class, it responds more readily to confidence than to criticism, and there is no reason why the members of the great Railroad Commission of this state should not develop and establish a system of rules and precedents as wise and beneficent within their sphere of action as those established by the early common-law judges. We find the statute well framed to bring this about.

Upon the question of the character of the evidence that might be considered by the Commission in arriving at a conclusion, the court has made several interesting rulings. Thus in the Appleton Water Works case [1] it was held that the expert judgment of the Commission might be

[1] *Appleton Water Works Co.* v. *Railroad Commission of Wisconsin*, 142 N. W. Rep., 476; 154 Wisconsin Reports, 121. This case is analyzed in greater detail as to the court's ruling in the discussion of "Valuation," Ch. III.

exercised in determining elements in fixing a just compensation that a municipality is obliged to pay to a company whose property it seeks to acquire under the provisions of the law. Another phase of this question is also presented in the case of the Wisconsin Lakes Ice & Cartage Company. In this case the Commission reduced the rates for shipments of ice and the carrier claimed there was not sufficient evidence in the record to modify the existing rate. It was held, however, that the Commission, because[1] of its administrative nature and expert knowledge, might apply that knowledge in the determination of reasonable rates without the formality of trial or hearing or the formal taking of evidence, and that "great latitude should be allowed in the admission of evidence and a comparison with other rates is admissible." The opinion holds that the Commission may take judicial notice of all reports of railroads to the Commission and that it might consider the information contained in such reports without the same being introduced in evidence upon the hearing.

Service requirements of the legislature or the Commission imposed upon the railroads have also been generally upheld. A law requiring the upper berth in a sleeping car to be kept closed until engaged or occupied, when the lower berth is being used, being limited to intrastate traffic, "is not[2] an interference with interstate commerce carried on in cars doing both intrastate and interstate business, there being no specific regulation touching the matter in conflict therewith, so that it can do no more than incidentally affect the interstate commerce so carried on."

The Dwight service order, cited above, has been followed

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[1] *C. & N. W. R. Co.* v. *Railroad Commission of Wisconsin*, 145 N. W. Rep., 216; Concurring opinion by Chief Justice Winslow, *Ibid.*, 974.

[2] *State* v. *C. M. & St. P. R. Co.*, 140 N. W. Rep., 70; *also see State* v. *Rodman*, 134 Wisconsin Reports, 89; 114 N. W. Rep., 137.

by court rulings in other service cases that broaden the interpretation with regard to passenger-train service to be furnished to smaller communities. The minimum of reasonable railroad service to be furnished to villages with a post office and having two hundred or more inhabitants has been prescribed by the legislature. This law provides that every railroad corporation operating within the state shall maintain a station at every village of two hundred inhabitants within one-eighth of a mile or more of its line. It shall stop one passenger train each way at such station daily, if trains are run on the road to that extent. If four or more passenger trains are run each way daily, at least two passenger trains each way must be stopped. Following these statutory provisions the Commission ordered the Chicago, Burlington & Quincy Railway Company to stop two of its passenger trains each way daily at Cochrane, a village of about two hundred and sixty inhabitants. In its order the Commission said that it believed the village already had adequate service, but that the law made the ordering of this additional service compulsory. The trains to be stopped would be interstate trains, unless the company put on additional local trains.

The review of the order by the state supreme court broke new ground in the conclusions promulgated. First, the court held [1] that an accommodation freight train could not be counted as passenger-train service within the law, and second, that the act not only applied to intrastate but also to interstate trains. Justice Vinje, in the majority opinion of the court, said: "That a state regulation may indirectly or in a slight degree affect or interfere with interstate commerce does not render it void, if that is not its purpose and if it has another legiti-

[1] *C. B. & Q. R. Co.* v. *Railroad Commission of Wisconsin*, 140 N. W. Rep., 296. This case is now pending in the federal Supreme Court on appeal.

mate object." It was also claimed by the railroad that if an extra local train were put on to fulfill the service requirement without stopping interstate trains, the revenue would not equal the expense. To this the court replied: "It is not shown, however, that the whole passenger revenue of the road in this state is not ample to meet the additional expense, with a fair margin of profit. But even if that were not so, it is no answer to say that it would have to be performed at a financial loss."

Still another question of freight service, in which this provision of the statute was involved, was raised in different form in a still later case. The Commission found that adequate service required the establishment of a new milk station (Omdall's) in the heart of a dairying country, where twenty-three farmers might bring from 80 to 100 cans of milk and cream daily for shipment. Certain passenger trains were ordered to be stopped to take on these consignments. The railroad objected and took the matter into court. It claimed that the right to fix minimum service had been taken away from the Commission by statute. But the supreme court held [1] that the statute requiring certain passenger trains to stop at villages of two hundred or more inhabitants did not interfere with the power of the Railroad Commission to establish a milk station and require passenger trains to stop there. The court was unanimous in finding this a reasonable service requirement.

From the service that a railroad must furnish a community we turn to service requirements that a manufacturing plant off the line of road may demand. The right of the Commission to order a railroad to operate its line by spur track within three miles of the main road to a manufacturing plant, under a law passed in 1909, if in the

[1] *C. M. & St. P. R. Co.* v. *Railroad Commission of Wisconsin*, 146 N. W. Rep., 1129.

judgment of the Commission public convenience demands it, has been held by the court to be a valid enactment. In the only contested litigation on this subject the court held that this power in the Commission was not an exercise of legislative functions, and it might lawfully be delegated to a quasi-judicial tribunal. In the instant case the owners of land to be crossed by the spur track contended that the power to condemn land upon which to build a track contravened the state and federal constitutions, which prohibit the taking of land for private use. The court held that the track when built, regardless of who pays for its construction, becomes a part of the trackage of the railroad system, and hence devoted to a public service.[1] The federal court in an opinion by Justice Hughes affirmed this view.

The separation of grade crossings of highways and railroad tracks and the protection by safety devices of grade crossings that cannot be separated have been numerous. In 1909 a statute was enacted authorizing the Commission to change the grade of such crossings wherever public safety required it, and to apportion the expense between the railroad and the municipalities.[2] In one of the cases which reached the supreme court the Commission required a town to pay 10 per cent of the cost of a viaduct over two railroads which crossed the highway in close proximity to each other. The town contested the order in an attempt to shift the entire burden onto the railroads.

In affirming the Commission's order, the court through

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[1] *C. & N. W. R. Co.* (Eden Independent Lime & Stone Company, intervener) v. *Union Lime Co.*, 140 N. W. Rep., 346; *also see Union Lime Co. et al.* v. *Railroad Commission of Wisconsin et al.*, 144 Wisconsin Reports, 523; 129 N. W. Rep., 605.

[2] In the case of the *City of Superior* v. *Roemer et al.*, 141 N. W. Rep., 250, the court held that where a municipal ordinance had been passed before the law became effective and was served upon a railroad compelling it to pay the entire expense of a crossing, the legislative enactment did not apply.

Justice Barnes said:[1] "The statute under consideration does not conflict with any constitutional provision. Indeed, no claim is made that it does. The legislature in the exercise of its police power has a perfect right to enact the law. The frequency of accidents at grade crossings is notorious and the number of victims is appalling. The aim of the legislature is to lessen the number of these casualties. We believe that no court has held that the legislative power here exercised did not exist. It was neither inequitable nor illegal to require the owners of the three public highways involved to contribute to the expenses of the overhead crossing."

Closely akin to the power imposed in the section of the law contested in the above case was another which gave the Commission power under the certificate of public convenience and necessity law to determine the place and manner of crossing of different railroads.[2] The law has been sustained by the supreme court. This law applies more particularly to a proposed railroad crossing the tracks of an existing system. Under the decision the expense of making the crossing is placed upon the junior road.

The "reparation" laws have also been before the supreme court for construction. Under these laws, if a shipper believes that an excessive rate has been charged on a consignment, he may bring proceedings before the Commission. If his complaint is sustained, the Commission orders a refund against the railroad company for the amount of the excess charges. The court decision affecting this statute[3] held that the provision requiring as a condition precedent to the recovery that the action be brought before

[1] *Town of Polk* v. *Railroad Commission of Wisconsin*, 143 Wisconsin Reports, 191.

[2] *State ex rel. Northern Pacific R. Co.* v. *Railroad Commission of Wisconsin*, 121 N. W. Rep., 919; 140 Wisconsin Reports, 145.

[3] *Frank A. Graham Ice Co.* v. *C. M. & St. P. R. Co.*, 140 N. W. Rep., 1097.

the Railroad Commission, instead of in the courts, did not deny the right of trial by jury guaranteed by the state and federal constitutions. Justice Kerwin in the opinion of the court said that, "the legislature has the right within constitutional bounds to fix rates, and a remedy by action against the Railroad Commission is preserved in favor of any aggrieved party, so the rights of all parties are well guarded under the law." As the cost of proceeding before the Railroad Commission is but a fraction of the cost of court litigation, this decision has been considered a victory for the people.

The capitalization of railroads is generally regarded as connected with the supervision of rates and service.[1] Previous chapters have shown the evils of burdening the public with excessive capitalizations. The legislature of 1907 clothed the Commission with the power to regulate the issuance of the securities of all public service corporations. The validity of the act was tested in the courts. Unfortunately but a single phase of the purpose of the act was involved in the case, and in passing upon this the court limited the authority of the Commission to the mere matter of determining the competency of the corporation to issue the proposed securities.[2] Previous to this decision the Commission had assumed the power to investigate the financial history of the corporation from its inception, and although not possessing power to refuse the authorization of the securities desired, if the same should be determined to be legal, it nevertheless reported upon the entire history of the corporation in connection with the grant of authority to issue the securities. In view of the decision of the court curtailing the power of the Commission, the legislature of

[1] Dunn, "The American Transportation Question," Preface, v; *also see* Ch. XVI supra.

[2] *State ex rel. M. St. P. & S. S. M. R. Co.* v. *Railroad Commission of Wisconsin*, 137 Wis. Reports, 80; 117 N. W. Rep., 846.

1909 passed the present stock and bond law, which is probably the most stringent law in effect anywhere and has been the basis of all legislation on the subject in other states since its enactment. It is still an open question whether this law is really the solution of the problem of the proper regulation of public service corporation securities.

COURT DECISIONS TOUCHING UTILITIES OTHER THAN RAILROADS

Besides the decisions heretofore referred to, relating exclusively to railroads, the supreme court has rendered a number of decisions of general importance on the subject of the regulation of public utilities. The leading questions that have been considered involve (a) the effect of the Public Utility Law and the Railroad Commission Law on franchises; (b) the validity of contracts to furnish free service made by cities with utilities before the enactment of the law; (c) the reasonableness of rates and the division of territory between competing telephone companies; (d) service rules and requirements, including a definition of the term "public" as used in the Public Utility Law.

Naturally a law involving franchises, which is revolutionary in its character, gave rise to many complicated legal questions. The indeterminate permit provided by the statute as a substitute for existing and future franchises was a novel experiment. The disorder that existed at the time over the variety of franchises that had been granted is well illustrated in a recent case, when the court had this feature of the law under consideration. Justice Marshall said:

The confusion created during the years preceding the Public Utility Law of 1907 [1] by granting franchises in several different

[1] *La Crosse v. La Crosse Gas & Electric Co.*, 145 Wisconsin Reports, 420.

ways—some directly by the state, some by cities as state agencies, some by the state in the main but with power to the various municipalities as state agencies to add supplementary features, fitting particular situations, some by the state without regard to local police regulations, and some likewise having such regard, either expressly or by necessary implication, some having contractual features creating doubt in regard to their constitutional status, and some having such features but without doubtful character, many of such matters being, in the ultimate, more or less detrimental to consumers, whether public or private, and proprietors as well—on the whole created a perplexing situation in respect to harmonious administration. The legislature sought to deal efficiently with this mixed situation, the growth of years.

The right of an interurban railway company voluntarily to increase rates of fare, regardless of franchise provisions, was considered by the court in the case of the *City of Manitowoc* v. *Manitowoc & Northern Traction Company.*[1] The city had granted the use of its streets to the interurban line specifying as one of its conditions that the rate of fare for carrying passengers between Manitowoc and Two Rivers should not exceed ten cents for a single trip, during the life of a thirty-five-year franchise. This was prior to the enactment of the law conferring jurisdiction upon the Commission over rates and services of steam railroads, interurban electric railroads and street railways. Several years after the law had been in force, the traction company announced its intention to increase the rate of fare between the points mentioned to fifteen cents. The city began an action to compel the company to abide by its contract.

The court held that in granting franchises a municipality acts as the agent of the state; that the governmental power to fix rates was not surrendered to the municipality,

[1] *City of Manitowoc* v. *Manitowoc & Northern Traction Co.*, 145 Wisconsin Reports, 13; 129 N. W. Rep., 925.

and that where no such specific authority had been granted, the contract would remain valid between the parties until the state exercised its paramount right to fix rates. In the opinion of the court Justice Barnes said:

> It is contended that this law (Railroad Commission Law) has superseded the contract involved in this suit and that therefore the contract no longer has any binding force or affect. We do not think so. The statute worked no change in existing rates. It simply provided that all rates should be reasonable, and left to the Railroad Commission the power to determine the fact as to whether or not a given rate was reasonable. When the determination was reached the law became operative upon the particular rate called in question and the rate arrived at then became the lawful rate and continued so until set aside in the manner provided in the law. The Railroad Commission has made no determination in the case before us. Until that determination is made the contract is in force.

The judgment of the court refusing an increase in fare may now be contrasted with another case in which the Commission reduced the franchise rate of a company as unreasonable. The court sustained the action of the Commission on the ground that the common council of a city has no power to make a contract with a street railway company fixing rates of fare for a series of years, which would prevent the Railroad Commission from changing the rate at any time. The case was brought by the Milwaukee Electric Railway & Light Company to vacate an order of the Commission requiring the company to sell tickets in packages of thirteen for fifty cents, instead of twenty-five for one dollar, as provided in an ordinance passed by the city and accepted by the company in January, 1900. The turning-point of the case was whether Section 1862 of the statutes, which provides that city councils may grant the use of street railway companies "upon such terms and

conditions" as they may determine, gives power to the council to make a contract with the company that it shall have a right to charge certain fares for a series of years, which contract cannot be interfered with or impaired by the legislature or the Railroad Commission. The opinion[1] by Chief Justice Winslow says in part:

The power to fix rates and tolls to be charged by public utilities is one of the attributes of sovereignty. With us this great power is vested in the legislature, and when the legislature speaks upon the subject its voice is controlling and supreme, unless indeed some constitutional guaranty is invaded. *Madison* v. *M. G. & E. Co,* 129 Wis., 249. A century ago this great power was of little practical importance, and very seldom used. The public utility as we know it had not yet come; life was comparatively simple, individual wants few and individual resources generally sufficient to provide for them; the ordinary citizen knew little about gas and less about electricity, which he regarded as nothing more than a supernatural and remorseless destroying force. He drove his own horse, if fortunate enough to own one, drank water from his own well, had no telephone, sent no telegrams, used no railroad, sent no express packages, and was dependent upon no public utility, either for the necessities or luxuries of life. No such life is possible to-day, however. The progress of science and invention, combined with the tremendous growth of congested urban areas, has made the great mass of the people absolutely dependent upon the great public utilities of the time. Modern business and modern life could not go on without them. The urban citizen of to-day goes to his business upon the street railway and transacts it with the aid of the telegraph, the telephone, the express company, and the commercial railway. The gas and electric companies light his home, cook his meals, furnish him power for domestic operations, and sometimes even furnish him heat; while water companies provide him with water and telephone companies afford him opportunity at any moment for conversation with friends either at home or in distant cities.

[1] *Milwaukee Electric Railway & Light Co.* v. *Railroad Commission of Wisconsin,* 142 N. W. Rep., 491.

We must catalogue our public utilities and try to imagine how we would get along without them, if we would realize our dependence upon them; only by so doing can we appreciate the supreme importance of the rate-making power and the necessity of keeping that power intact in the hands of the legislature; if it be not so kept the opportunities for abuse are numerous. Clearly the legislature should not part with the power, even for a limited time, except upon the most potent and convincing considerations.

No presumption can be indulged that it has parted with the power, nor will doubtful words be construed as having that effect. He who asserts that the state has surrendered any part of its sovereign power even temporarily in his favor must prove the fact by the most convincing evidence. The presumptions, if any there are, must run the other way. If it were to be admitted for the purpose of the argument that the legislature could by express language authorize municipal authorities to make contracts with public utilities fixing rates that should exist for definite periods in the future and be beyond legislative control during those periods (a proposition concerning which we intimate no opinion), the question here is whether such express language is to be found in Section 1862.

After reviewing all of the authorities the opinion arrives at the conclusion that the section was not intended to give city councils power to bargain away the sovereign right of the state to regulate fares, and concludes thus:

We reach this conclusion the more readily because this state has adopted an eminently just and wise policy in dealing with the matter of rates and tolls. By the Railroad Commission legislation it has laid down the general rule that every rate must be reasonable, and has left it to a commission of experts to determine, after full investigation, the reasonable rate, and apply it. It is believed that this board passes on these questions with judicial fairness after the most careful and searching investigation of the conditions, and with a single eye to the attainment of a fair result. So long as these provisions of law remain in force,

and are allowed to control the situation, all danger of immature, hasty or vindictive changes in rates is practically eliminated. On the one hand, the citizen is protected from unreasonable and excessive fares; on the other, the capitalist and inventor is assured a reasonable and fair return upon his investment. No door is open for any serious injustice.

The view which is here taken of the meaning and effect of the provisions of Section 1862 renders unnecessary any consideration of the question whether the ordinances in question are subject to alteration or repeal under Section 1 of Article XI of the Constitution, which authorizes the enactment of general laws for the formation of corporations without banking powers, and forbids the creation of corporations by special act except in certain instances, and reserves the right to alter or repeal at any time all such general laws or special acts.

The proposition decided in this case is that Section 1862, Statutes, does not empower municipal authorities to make any contract with a street-railway company, fixing rates of fare so that they may not be changed by the legislature, or through a legislative agency in the manner provided by law.

The Wisconsin court was sustained in the Milwaukee fare case, June 14, 1915, by the United States Supreme Court. The question as to whether burdensome provisions of an old franchise were retained after a company had received an indeterminate permit under the Public Utility Law was decided in the case of the *City of La Crosse* v. *La Crosse Gas & Electric Company*.[1] This case arose upon the refusal of the utility company, which had surrendered its franchise and received an indeterminate permit, to continue paying a 2-per-cent fee on its gross earnings annually into the city treasury required under the terms of the franchise for the use of the streets. The court held that the city of La Crosse had no power, in granting this

[1] *La Crosse* v. *La Crosse Gas & Electric Co.*, 145 Wisconsin Reports, 408; 130 N. W. Rep., 530.

franchise, to annex the license or tax features. Such a power it pointed out must be plainly conferred upon a city in order to be valid. The city acted as an agent of the state in granting the franchise and by the company's voluntary surrender of it and the acceptance by the state, they mutually "agreed to abrogate the franchise and necessarily, as we shall see, the incidents attached by the state agency were abrogated likewise. Such mere incidents could not well inferably survive the primary thing." Continuing the reasoning further, the court says that though the city had the power to attach the license fee requirement to the franchise, the indeterminate permit operated to free the utility of the burden. Its reasoning is to the effect that an indeterminate permit is granted subject to the terms of the Public Utility Law, and not subject to other terms and conditions which may be found in the franchise surrendered and which are out of harmony with the uniformity idea of franchises in the public utility statute.

Briefly stated the La Crosse case lays down the rule that conditions and privileges which "inhere in" and "form a part of" the grant of the right to use the streets are grants by the city as a state agency and are abrogated by the waiver on the part of both the state and the utility consummated by the acceptance of the indeterminate permit. It is almost as plainly indicated—an inference which will be more fully discussed in the Douglas County telephone case—that conditions that do not "inhere in" and "form a part of" the grant of the privilege itself but are independent business contracts for service to be rendered, are subject to the ordinary rules of contracts, entered into by the city as a business corporation, and cannot be abrogated by the state.

Still another phase of the indeterminate permit law arose in the Calumet service case. As already explained in an earlier chapter, utilities under the indeterminate

permit are protected from competition, except as the Commission may find upon investigation and hearing that public convenience and necessity demand the service of a competing plant.[1] Upon a disagreement between the Calumet Service Company and the city over street-lighting rates, the city asked the permission of the Commission for the right to establish a municipal plant to do street lighting. This was refused on the ground that the city could obtain adequate service at reasonable rates from the existing company. An appeal was made to the courts, the supreme court holding that, while the city had the right to purchase the existing plant, it could not enter into competition with it without an order from the Railroad Commission.[2] In the opinion of the court Justice Marshall reviews the purpose of the Public Utility Law at great length and says:

> That one of the principal mischiefs sought to be remedied by the new system was the elimination of the conditions promotive of hostilities between municipalities and public utility companies, after making large investments by permission and invitation to serve the public directly as well as indirectly—bitter controversies, sometimes for good reasons and sometimes not, but in any event at the expense of consumers of the product—seems quite certain.
>
> It likewise seems certain that one of the major means for attaining the desired end was elimination of excessive investments, and excessive expenses caused by two or more public utilities, each with its separate property and fixed charges, where the need of the consumers only required one, and elimination of risks to investors by encroachments upon an occupied field of public service without any public necessity therefor. Doubtless an unvarying and invariable economic law was squarely faced and appreciated, that all such subjects for elimination represent waste, which if not avoided would, in the main, fall on the product, in-

[1] *See* Ch. XV for a fuller discussion of the economic reasons prompting the passage of the indeterminate permit law.

[2] *Calumet Service Co.* v. *Chilton*, 148 Wisconsin Reports 334; 135 N W. Rep., 131.

creasing the cost of service per unit, and be paid by the consumers. It was the interests of consumers which was the prime subject of legislative solicitude; such object to be conserved without injustice to others.

In the situation pictured it could not have escaped legislative consideration, and necessarily would not have been considerately left unguarded against, that in the cities and villages of the state, in general, public utility service at the lowest practicable rates with the highest practicable efficiency, is impossible without combining the municipal service with that to others.

After discussing other considerations why the legislature would have reasonably included municipal plants within the provisions of the law and not have allowed them to start menacing existing investments whenever they desired, the court reviews the method by which the city can purchase the plant under the terms of the law and concludes thus:

The conclusion which must result from the foregoing is that the relief granted respondent is not excessive. The field of exclusiveness of the privilege, in the circumstances in this case, include municipalities, whether desiring to evade the forbidden territory for municipal lighting only, or for other or all purposes.

This decision has been criticized severely by Socialists because it does not permit a municipality to establish a plant at any time, but requires it to purchase the existing plant if it desires to enter the public utility business. The fact is, nevertheless, that the method provided for acquiring public utilities by municipalities has given impetus to municipal ownership. A city under the law may purchase a private plant at a valuation to be fixed by the Commission, and if there is but one plant operating in the municipality it thereby obtains a monopoly of the business.

Practically the same rule was promulgated in another

case except that the proposed utility was to be a competing private plant.[1] The court held that where an indeterminate permit had been acquired the municipality could not grant a conflicting franchise unless the Railroad Commission had upon ascertainment of facts determined that public convenience and necessity required a second utility to engage in the same business. In the absence of such a declaration by the Commission a municipality was without authority to grant a competing franchise.

The distinction between a franchise provision that is accepted, subject to the constitutional reservation that the legislature may repeal or amend the same at any time, and an independent contract in no way connected with the franchise, is made in the case of *Superior* v. *Douglas County Telephone Company.*[2] In order that it might furnish its subscribers with telephone connections at the city hall, the company entered into a contract with the city to furnish free service for an indefinite period, in return for the privilege of being allowed to wire the city hall and install phones in the city offices.

The validity of the contract was challenged because of the prohibition of the statute against free service. To determine the question, the Commission took the position that its general order wiping out all free service and reducing rates was applicable to the city of Superior in the particular mentioned. The court held the contract valid on the ground that it was especially exempted by the statute declaring all existing contracts as non-discriminatory. It was also held that the term thereof was not indefinite because it provided specifically that the company should render the service so long as it operated a plant within the

[1] *State ex rel. Kenosha Gas & Electric Co.* v. *Kenosha E. R. Co.*, 145 Wisconsin Reports, 337; 129 N. W. Rep., 600.

[2] *Superior* v. *Douglas County Telephone Co.*, 141 Wisconsin Reports, 363; 122 N. W. Rep., 1023.

city. The distinction made by the court between this case and the case of the La Crosse Gas & Electric Company[1] is that in the former "the contract was in the nature of an ordinary agreement *inter partes*. It did not inhere in a franchise corporate or otherwise." The Superior city contracts were outside the scope of the state agency authority and involve in contradistinction to that authority "the granted business capacity of a municipality or other corporation to make contracts as a private person might, within the scope of the municipal power to contract."

Perhaps the reason for exempting the contract can be made plainer when considered in connection with the decision of the Home Telephone Company of Kenosha. Here a franchise contract is involved, rather than a business agreement. The company had been granted a franchise containing the stipulation that telephones were to be furnished free to the city. Under the order of the Commission against free and discriminatory service the company refused to furnish the service longer to the city of Kenosha free. The city sought through the courts to enjoin the company from charging a rental.[2] The court held that regardless of the Public Utility Law the franchise granted by the city to the company was inoperative and void. The franchise conferred upon this company under the general statutes "gives it full authority to construct its lines upon the public highways of the state and the streets of municipalities subject only to reasonable regulation under police power. A city ordinance purporting to grant a franchise to a telephone company and requiring the company in consideration therefor to furnish a certain number of free telephones to a city, cannot be considered as a contract.

[1] *La Crosse* v. *La Crosse Gas & Elec. Co., supra.*

[2] *City of Kenosha* v. *Kenosha Home Telephone Co.*, 149 Wisconsin Reports, 338; 135 N. W. Rep., 845.

The city in such case on its proprietary right has no consideration to give for such contract for it cannot barter the exercise of its police power for free telephones; and as a state agency the city has no power to enter into a contract not subject to amendment by the Public Utility Law."

The right of a city to make a contract with a utility since the Public Utility Law was passed, which by a subterfuge amounts to free service, has also been condemned by the supreme court. When the Southern Wisconsin Power Company built its generation dams at Kilbourn City it was found that the land used by the municipal water and lighting plants would be flooded. After nearly three years of bickering the company finally consented to rebuild the plants for the city in another locality and pay the sum of $3,500 annually for a period of time and the city was in turn to purchase power from the company at the regular rates. At the end of the first six months the city of Kilbourn brought an action to recover the $1,750 due. The company interposed a counter-claim of $1,928.08 for current used. The court found that the contract was in fact one for the furnishing of free service,[1] the company originally agreeing to pay the municipality these sums as a subterfuge. The court held that a municipality buying power from another public utility for the operation of its own plant stands on the same footing as a private consumer and cannot be given a more advantageous rate than other users are charged for like service.

The contract was made before the Kilbourn dam plant became operative and the claim was made that for this reason the contract was exempted from the provisions of the Public Utility Law. Justice Barnes in the opinion of the court replied:

[1] *Kilbourn City* v. *Southern Wisconsin Power Co.*, 149 Wisconsin Reports, 169; 135 N. W. Rep., 499.

We cannot adopt this view. If it is correct, then any projected railroad could, at any time before the road actually commenced to serve the public, enter into perpetual contracts whereby certain shippers were favored. Any new telephone, electric light or water company could make all kinds of discriminatory contracts before they actually began to serve the public. It is the duty of any new utility to make its schedule of rates and file it with the Railroad Commission at or before the time it commences to do business. Sec. 1797m-33. The matter of regulating rates of charge by public service corporations and preventing discriminations is a governmental function and one over which the legislative branch of the government has a right to legislate within constitutional lines, and any contract which runs counter to a valid law in this regard, and that was not made under direct legislative authority, becomes superseded thereby regardless of whether it was made before or after the law was enacted.

It is interesting to note in this connection that the Commission has since reduced the rates to be charged Kilbourn City for the service nearly 50 per cent.

In the absence of proof that a special contract to furnish telephone service is unreasonably discriminatory, but a mere difference in dealing with customers, it is not condemned by the court.[1] A stockholder and a telephone company made a special contract, the stockholder paying 10 per cent above par for his stock and it being written into the certificate that he should have the use of a telephone and would never be required to pay a greater annual assessment on his stock than $10. After the Public Utility Law went into effect the company attempted to collect a regular monthly rental. Speaking through Justice Marshall the court said:

The point that the contract was discriminatory at common law is met by *Superior* v. *Douglas County Telephone Company*,

[1] *People's Telephone Co.* v. *Lewis*, 151 Wisconsin Reports, 75; 138 N. W. Rep., 100.

supra, holding that only unreasonable discriminations are so condemned, and absence of proof that there was any such discrimination in this case. . . . The case presents the question of whether a mere special contract with a public utility corporation for services made prior to the time limit mentioned in Sec. 1797m-91, one not adhering in a corporate franchise and so superseded by the Public Utility Law, but an ordinary agreement for service, recognized as valid and expressly given validity by such section, . . . can be relied on by one party thereto as binding on the other seeking to repudiate it. No reason is perceived why the answer should not be in the affirmative as it was below.

Again in a contract between two telephone companies, each of which had lines in the same territory, that one should confine its operations to the city and the other to the country, that they would make free connections and the rates would be less than the two separate, was found by the court not to be a combination to restrain or prevent competition within the meaning of the statutes.[1] This contract provided that the rural company should have the option of buying the rural lines of the other and that both having used the free connection the agreement constituted a mutual consideration, and the rural company could enforce the specific performance of the agreement, to which the city company was objecting, to sell the rural lines. More recently the court has sustained the Commission in a finding[2] to the effect that a local service rendered by a rural telephone company which was incidental to its rural and toll line service did not constitute the rural company as a public utility engaged in furnishing local telephone service to subscribers in that city. This decision strengthens the policy of the law as interpreted by the

[1] *McKinley Telephone Co.* v. *Cumberland Telephone Co.*, 140 N. W. Rep., 38.

[2] *Citizens Telephone Company of Eau Claire* v. *Railroad Commission of Wisconsin*, 157 Wisconsin Reports, 498.

Commission that duplications of telephone exchanges are unwise and that competition will not be permitted unless the same actually existed before the law was passed.

The question as to whether the Commission can compel two competing telephone companies to make physical connections is still being litigated in the lower courts. Such a law has been held invalid in many states, but the Wisconsin Commission believes it has succeeded in framing an order which obviates all of the legal pitfalls that have nullified the laws in other states.

There has been scarcely no important litigation over the question of service. In one case [1] the court held that the rule of a heating utility that had been filed with the Commission providing for the installation of thermostats by the company at cost to the subscriber, the user of heat having no regular contract to furnish heat for a fixed time, was not an unreasonable requirement. It held that in the absence of such a contract there was no ground for interference by a court of equity to restrain the company from discontinuing the service because of refusal to comply with the rule.

When a landlord operates a heating plant and sells his excess service to a few neighbors in the interest of his own plant economy, such an arrangement does not constitute his plant as a public utility. If the product is intended for, and open to the use of members of society, who may desire it to the extent of the plant's capacity, the owner thereof is a public utility. The court defines [2] the word "public" to mean more than a limited class defined by the relation of landlord and tenant "or by nearness of location, as neighbors, or more than a few who by

[1] *Walbridge* v. *Berlin Public Service Co.*, 151 Wisconsin Reports, 69; 138 N. W. Rep., 44.

[2] *Cawker* v. *Meyer et al.*, 147 Wisconsin Reports, 320; 133 N. W. Rep., 157.

reason of any peculiar relation to the owners of the plant can be served by him."

Students of regulation have not always found themselves in complete accord with the decision in the Douglas County Telephone case and the Cawker case in which the term public is given a somewhat limited definition. But there are so few cases affected by either of these rulings that they are considered only momentary, compared with the broader interpretation, which the court has given to the terms of the Public Utility Law where great principles were involved and important public interests in the balance. The Milwaukee fare decision will always stand out as a monument to the court for the doctrines there promulgated —the unshackling of a manacled public.

CHAPTER XXIV

CONCLUSION

Contrasting present conditions with those before the period of regulation, the evidences of advance are too many to escape the conclusion that state regulation has been a success. Perhaps it has not fulfilled the iridescent dream that many entertained. Its stability, however, rests upon a continuance of the methods and policies pursued. Failure to continue along the lines already followed would quickly result in retrogression.

The saving feature of the Wisconsin law, which placed it above many of the similar enactments in other states, is the publicity requirement. All the facts gathered by investigations as to the value of properties, the quality and cost of the service, are disclosed to the public. Decisions are all printed; the files of the Commission are open to public inspection and there are no secret hearings. The public is taken into confidence.

Since the enactment of the law there has been less lobbying by railroad and utility lobbyists before the legislature. Instead of giving direct relief by statutes, power to correct new evils arising is given to the Railroad Commission in order that the problems may be settled justly after a scientific investigation. Such legislation has practically, if not completely, driven the railroads out of politics.

Moreover, regulation has quieted public clamor, always a disturbing factor to business. With railroad and utility

patrons paying rates on the same basis for service rendered; with proof from the annual report and the frequent audits of all financial dealings of these corporations, and the consequent elimination of extravagant profits; with the constant supervision of operating accounts and enforcement of constantly improving service standards, and finally with the elimination of all unnecessary wastes, there has come about a condition which it is hoped will eventually establish an "era of good feeling." It is now possible for a dissatisfied municipality to purchase a plant that it was impossible to gain control of before the indeterminate permit law was passed. Such cities find encouragement in the law because through state regulation they have the benefits of a state engineering staff for consultation and for information as to increasing plant efficiency. The insuring stability of investments and public contentment prove the worth of state regulation. Regulation has given better service, more economical and scientifically built rates, and has completely eliminated unjust discriminations.

In the eight years ending June 30, 1913, during which the Commission has had jurisdiction over railroads, the savings in freight and passenger charges to the public have approximated $2,400,000 annually. The six years of supervision of public utilities also show great results. The reductions in the rates of gas, water, etc., amount to $800,000 annually. This figure does not include the savings to consumers through better service, which a very modest estimate would place at more than $150,000. This makes an annual utility saving of $950,000. Thus, the results of the Commission for the eight years of its existence have been a total annual saving of $3,350,000.

Prior to 1912 no separation of the cost of the work of the Commission was kept as between utility and railroad services. At the beginning of that fiscal year, however, a

cost accounting system was installed so that now it is possible to allocate the expenses of the different phases of the work. Herewith is given a table showing the total expenses of the Commission for each year since its organization, the total for the four years in which there were no cost accounting records being apportioned on the basis of the two years for which records are available.

EXPENSES OF COMMISSION

Fiscal year		Railroad	Utilities	Total
1906	Actual	$26,126.95	.....	$26,127.95
1907	Actual	35,314.84	.....	35,314.84
1908	Apportioned	23,081.19	42,602.32	65,683.51
1909	Apportioned	33,343.48	61,544.05	94,887.53
1910	Apportioned	33,490.76	61,815.90	95,306.66
1911	Apportioned	41,750.17	77,060.78	118,810.95
1912	Actual	51,674.89	90,602.82	142,277.71
1913	Actual	56,364.71	108,787.80	165,152.51
Total		301,146.99	442,413.67	743,560.66

The population of the state is nearly 2,500,000. This means that the Railroad Commission has effected a direct annual saving per capita for every man, woman and child in the state of $1.34, and it is not difficult to conceive how much greater the annual saving is to the actual patrons of these public service institutions. During the eight years the Commission has been organized, its average yearly cost has been somewhat less than $100,000, or a per capita expense of four cents. The average annual return is $1.30 or 3,250 per cent on the amount invested.

What of the future? The increasing scope of the powers exercised by the Interstate Commerce Commission and the limited sphere possible in regulation of rates within states suggest that the future may see the establishment of sub-

sidiary federal commissions that will regulate railroads by groups. But the principle of regulation will persist. Wisconsin has made progress through its own method of regulation. The application of the same economic principles to the wider spheres of national control might well be beneficial. Until this is done, however, a state commission that devotes a large part of its time to railroad problems is absolutely necessary.

The next decade is apt to witness great changes in the sphere of railroad regulation, and the state control of public utilities—gas, electric, water, telephone, interurban railroads and heating companies—will undoubtedly be strengthened. These problems are local and beyond the pale of federal control. Viewed from an economic standpoint, even with a more rapid increase of municipal ownership which appears probable in the future, state regulation will still be necessary. For municipal plants the state commission will be a great clearing house of information—engineering, statistical and managerial—where the latest methods and devices of reducing costs, making scientific rates, enforcing of rules for improved service, gathered from over the world, will be at hand and may be applied to the arising complicated problems. In so far as private plants are concerned, the existence of a state commission will insure fair treatment alike to capital and consumers and vouchsafe that no return to the unequal and discriminatory rates previously in existence will be made. Its powers of control should be strengthened rather than curtailed.

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